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THE Dakota tin mines have appeared in London, where the Harney Peak Tin Mining Company has been organized, as announced in the ENGINEERING AND MINING JOURNAL last week, with a capital stock of £2,000,000, or $10,000,000 in 100,000 shares of £20 or $100 each.

This our readers will remember is the property which made such a splurge about the time it started its great Etta 200-ton mill and exhausted its dump, and some say its mine, in producing 7½ tons of concentrates from 400 tons of ore.

As we have several times stated in these pages, there are some very promising tin "prospects" in Dakota, and we believe and sincerely hope that some of them will upon exploration be found to open up into profitable mines; but up to the present time, no productive mine, or mine that gives reasonable assurance of being profitable, has, so far as we are informed, been opened or found in Dakota. The idea of there being any tin property there worth $10,000,000, or any thing like that sum, is simply absurd. This is a little worse than the usual Anglo-American-bubble; but as there is not the least probability of its securing the capital in England, we may dismiss it as harmless.

The board of directors are to receive the most magnificent remuneration—$7500 a year to the chairman, $5000 to the vice-chairman, and $2500 to each of the other eight directors; say $32,500 a year to the London board of directors. What a lot of titled "guinea pigs" this would buy! And yet the board of directors is composed of people no one ever heard of—not a title among them. Assuredly, this scheme has been badly bungled in bringing out, and no wonder our correspondents say "it has not a chance of going through."

AUSTRALIAN DEVELOPMENT.

Under this title, Mr. C. H. LEETE gives in our excellent contemporary, the *Evening Post*, some very suggestive statistics, which go to show that the Australian colonies are worthily maintaining the pre-eminence of the Anglo-Saxon race for enterprise, intelligence, and progress. The following table, making a comparison between Australia and our own country, contains so many suggestive facts, we reproduce it. Assuredly a nation that can make such a showing is a good one to cultivate commercial relations with, and its people show their intelligence in appreciating the best tools, machines, bridges, furnaces, gold mills, and other things in which America takes the lead. Let us cultivate closer trade relations with the coming empire of the East, and our manufacturers, and especially those interested in the manufacture of mining machinery and appliances, bridges and other engineering works, will find there an appreciative market by making known their goods through the columns of the ENGINEERING AND MINING JOURNAL, which, in accordance with its advice, is making a large circulation in the Australian colonies.

	Australia.	United States.
Area, square mile	2,944,628.	2,970,000.
Acres, per head	759.	32·7.
Population, 1884	2 480,603.	55.556,000.
Population per square mile	0·823.	18 7.
Population in agriculture	15 per cent.	15 per cent.
Population in mfg. and min'g.	13½ per cent.	7½ per cent.
Population in trade and trans.	4½ per cent.	3½ per cent.
Pop., pro. and servants	9½ per cent.	8 per cent.
Wool, 1882	270,991,777 pounds.	272,000,000 pounds.
Sheep	58,569,561.	50,360,243.
All live stock	67.608,741.	152,811,338.
Grain	47,914,204 bushels.	2,982,881,500.
Grain per head	19 3-10 bushels.	53 7 10 bushels.
Yield of wheat	10 6-10 bushels per acre.	13 2-10 per acre.
Yield of oats	24 4-10 bushels per acre.	25 6-10 bushels.
Yield of barley	20 5-10 bushels per acre.	20 9-10 bushels.
Yield of corn	34 3-10 bushels per acre.	22 7-10 bushels.
Hay	1,096,026 tons.	48.470,460 tons.
Potatoes	142 5-10 bushels per acre.	75 8-10 bushels.
Potatoes, per head	3 9-10 bushels.	3 4-10 bushels.
Sugar	96.563,712 pounds.	263,000,000 pounds.
Sugar, per head	38 9-10 pounds.	4 6-10 pounds.
Cotton	147 bales.	6,550,000 bales.
Wine	1,791,065 gallons.	17 500,000 gallons.
Acres tilled	2.47 per head.	5.67 per head.
Gold, since '45	$1,342,000,000.	$1.683,500,000.
Gold yield	$23 416,000.	$31.801,000.
Silver yield	$435,520.	$51.600,000.
Coal yield	2,897,089 tons.	102,224 553 tons.
Coal, per head	1.16 tons.	1.75 tons.
Tin yield	$5,087.160.	
Copper yield	$4,785.850.	$17.789,687.
Iron yield	$142,040.	$73,761,824.
Lead yield	$150.000.	$10.537,042.
All mining pro	$16.47 per head.	$4.36 per head.
Manufactures	$28 per head (Victoria).	$107 per head.
Exports and imports, '84	$302,060,000.	$1,524,207,524.
Exports and imports, '84	$121 per head.	$28 per head.
Shipping, '84	390 tons per 100 inhabitants.	58 tons per 100 inhabitants
Shipping, '84	9,736,926 tons.	30 274,000 tons.
Railway mileage, '84	1 mile to 422 inhabitants.	1 mile to 442 inhabitants.
Railway mileage, '84	5,610 miles.	121,543 miles.
Telegrams	225 per 100 inhabitants.	119 per 100 inhabitants.
Debt, '85	$45?,523,555.	$1,367,657,568.
Debt, less railways, etc	$79,015,445.	$1,303,034,056.
Debt, less railways, etc	8-9 yearly revenue.	4.02 years' revenue.
Debt (entire)	22 cents per acre.	73 cents per acre.
Taxes	$12.68 per head.	$5.21 per head.
Army and Navy ap'n.	$1 871,030.	$58,691,658.
Bank deposits	$354,099,145.	$2.902,300.000.
Bank deposits	$142 per ad.	$55 per head.

THE LEAD AND ZINC ORES OF SOUTHWEST MISSOURI.

A little pamphlet recently published by JOHN N. WILSON, with contributions by F. L. CLERC and THOMAS N. DAVEY, gives some valuable "authenticated" statistics of the output of lead and zinc ores for the year ending 1887. These figures are in each case certified to by an officer of the company making the return.

Mr. CLERC contributes a very interesting study of the ore deposits, their character and origin, from which we shall make some extracts.

These deposits were described and illustrated in the ENGINEERING AND MINING JOURNAL, from The Report of the Geological Survey of Missouri

After describing the district and the presence in valley—depressions in the beds of limestone and chert of curious black slates, mixed with pieces of coal, Mr. CLERC says, in the pamphlet before us:

"The conclusions I draw from these slate basins are as follows: 1st. Before the slate was deposited here, it had formed part of a coal-bed in place; 2d, before it was brought here the limestones and flints of the lower carboniferous period had been deeply eroded by both surface and underground streams to the depth at least to which these slates are found; 3d, that the filling up of these old watercourses leveled up the country and the present system of rivers, creeks, and branches dates from that period, and is wholly or in part a new one; 4th, that these materials must have been brought to where they are in the form of very fine mud or silt, as though they were dropped from a slow moving river or a broad lake. They seem never to have covered the highest lands, for here the top clays rest directly on solid beds of either limestone or flint, these top clays seem to have

resulted in part from the disintegration in situ of limestone and chert beds, and in part resemble the so-called gumbo clays which cover the Kansas coal-beds. Above both of these kinds of clay, there are often found on high ground beds of rounded river pebbles, which are flint, and contain fossils common to the region. These pebbles evidently come from near by, and they are the largest masses in the region which appear to have been transported any distance.

The carving out of the later valleys has been a very interesting operation. Starting from the general level of the high prairies, the action of the rain water, flowing over the water-sheds, has for a large part of its course to Spring River been mainly chemical, dissolving carbonate of lime, and thus enlarging the minutest cracks in the rock to which it can find entrance. In this way only can be explained the facts that for a large part of their course there is little washing out of the surface clays by the small streams, and the strata of rock are often continuous across the bed even some distance from head, pitching toward the bed on one side, and rising on the other. Farther down stream, where the volume of water is greater, and the fall more steep, the roof over the underground stream breaks down and the current washes away the broken-up material, and there is only left, at the sides of the stream, broken strata pitching towards the center. Evidence of these underground streams in connection with the beds of surface streams, can be found throughout the region, in many cases they are sufficiently large to carry all the ordinary flow of the stream, so that only the flood waters are to be carried by the surface bed, which then becomes a dry fork. Underground branches, particularly of Turkey Creek, can be traced coming out of caves quite a distance away from surface branches. The width of the valleys of the present streams and the amount of erosion they have effected proves them to have been once much larger streams. All this appears to have taken place since the black slate was placed where it is now found. If the date of this be fixed as the close of the Ice age and the melting of the glaciers which has ploughed deep north and south grooves through the coal-fields to the north, it brings the origin of the present ore deposits down well into the Quarternary age. If now lead and zinc were contained in even the minutest traces in the black slate, it is easy to see how lateral secretion would effect their concentration. The small partion of the rain fall which worked its way through theslate would slowly leach out its mineral salts. This water could only circulate very slowly, drop by drop, but it would surely find its way into every crack and crevice open to receive it, and in some of them the minerals would be crystalized out. Thus every slate basin would become a separate source of ore deposits. The few that remain may be only a small part of those which once existed but have been entirely washed away. Going on simultaneously would be the action of the surface water, carving out the valleys and the low lands. As this cutting reached mineral beds already formed, it would cut through them, break them down, and mix them together with other *débris* at the sides of valleys. In some of the ore deposits, it looks as though the mineral-bearing waters had taken possession of drainage channels and filled them with ore, and forced the surface waters to carve out new ones. It is certain, on the other hand, that if the surface waters were turned into ore channels, they would soon cut out, oxidize and carry away the ore which they contain. In all the mining camps there are apparently more recent water-courses crossing the ore-fields, and sometimes only a few feet distant from large ore bodies, in which it would be useless to attempt to find ore. Practical miners recognize them, and call them mud openings.

"In conclusion, I would say that whatever the origin of the ore deposits may have been, present developments show them to extend much deeper than the early miners had any idea of, and as deep as we go there is evidence of open ground still below us. Each year's experience strengthens the belief that the ore deposits are continuous and will go as deep as the open ground goes. The study of geology may or may not disclose the greater richness of certain levels, mineral belts or ranges, and no better rule than the old one 'follow the ore' may ever be found, but it does not seem unreasonable to suppose that geology may lead to the discovery of missing links in the series of deposits, and so render mining less uncertain and thus hasten the rapid development of the region."

The practical outcome from these interesting deposits is summarized in the following table :

	Lead ore.		Zinc ore.	
	Amount.	Value.	Amount.	Value.
County.	Lbs.	$. c.	Lbs.	$. c.
Jasper	13,409,573	331,627.99	93,778,356	995.551 00
Newton..... ..	3,522,733	80.872.86	21,834,000	155,523.00
Lawrence.. ...	3,536.000	69,509.00	479,000	2,022.00
Cherokee, Kan..	5,924.294	142,183.05	63,526,000	508,208.00
Totals.....	26,392,600	$624,183.90	179,607,356	$1,661,304.00

These figures give 13,196 net tons of lead ore of an average value of a little over $47 a ton, and 89,804 tons of zinc ore, which had an average value of about $18.50 a ton. The total value of the output of lead and zinc ore in the twelve months was $2,285,496.94.

In 1872, the Missouri output of zinc ore was only 5171 tons, so that this industry is growing, and the report before us says : "The mines in this section are in their infancy, as there has never been any effort made to attract capital hither, and the mines have always been and are yet being worked with capital which the mines themselves have produced, and all the mine operators, with but few exceptions, have acquired all their wealth from the mines. No better field than this for safe investments, the possibilities of which are unlimited, can be found in the United States."

It is, indeed rare, that mines which have a depth of only 50 to 150 feet should have produced so largely, and the very low cost of production is evident from the fact that the companies operating in this district have been making money from mining lead and zinc ores, neither of which carries either silver or gold, and when the market price of lead in New York ruled about 3¼ cents, and of spelter about 4¼ cents, while at the mines the price was from a quarter to half a cent less than these figures.

This industry has gradually brought about the adoption of improvements in ore dressing and in smelting, and the district now possesses some of the finest ore dressing works in this country, and in its smelting works are found the Jumbo furnaces and improved methods of fume condensation and collection described in the columns of the ENGINEERING AND MINING JOURNAL by Mr. CLERC.

Magic Ink.—Any writing or picture made with a solution of cobalt chloride is invisible until heated strongly for a few seconds, when the written characters or picture appear of a blue color. By simply breathing upon the paper, they again disappear from view, to reappear if again heated

CORRESPONDENCE.

[We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.]

The Calumet & Hecla Charity.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The Calumet & Hecla Mining Company has issued the following appeal to its stockholders: "To the stockholders of the Calumet & Hecla Mining Company. Thirty acres of dwelling houses were burned at Lake Linden, the village adjoining the company's stamp-mills. Four hundred families, many of them employés of the Calumet & Hecla Mining Company, are homeless. Subscriptions for the necessary shelter, food, and clothing will be received by Chas. W. Seabury, Treasurer, 12 Ashburton place, and forwarded by him to the relief committee.

"A. AGASSIZ, President."

And some of us think that if the management would ask and get a better price for our copper, we could contribute more easily to this deserving cause; while if the managers would cut down only a very little of their extravagant expenditures, to which you recently called attention, they could rebuild the entire village of Lake Linden without calling on the stockholders at all, and without interfering with the efficient prosecution of work at the mines.

I suppose we cannot expect our "trustees" to do either of these things, and so, since the object is a noble one, I will, of course, contribute my mite.

A BOSTON STOCKHOLDER.

BOSTON, June 1, 1887.

NEW PUBLICATIONS.

REPORT ON THE PROGRESS OF THE ADIRONDACK STATE LAND SURVEY *to the Year* 1886, with an *Historical Sketch of the Work and Table of Elevations, Plates and Maps.* By VERPLANCK COLVIN, *Superintendent of Surveys.* Albany. 1886.

In this volume two reports are bound together: first, the report of March, 1886, with its appendices; and secondly, the report of February, 1884, with its appendices. The latter is provided with an index, which, being placed at the end of the volume, seems at first to refer to the whole book; but after a few vexatious disappointments, the reader discovers that the two reports are separately paged; that the first in order (but more recent in time) has no index; and there is no table of contents. Of this slovenly sort of book-making, Mr. Verplank Colvin ought to be heartily ashamed.

It is, however, the earlier report—the one which *is* indexed—that contains the largest amount of information of general interest: and both reports furnish undeniable proof of a good deal of persevering and useful labor in the important field they cover. Mr. Colvin has devoted himself to this work for many years, largely at his own expense, and deserves credit for his perseverance and progress.

Apart from the scientific and general importance of these surveys, their direct necessity is shown in the fact that, by tax sales and otherwise, some 14,023 square miles or about 750,000 acres of land have become the property of the State, and their boundaries need to be determined as a means of their intelligent administration or sale, the preservation of timber, etc. Mr. Colvin forcibly urges a complete survey, on a trigonometrical basis; and certainly nothing less should be considered worthy of the Empire State. We do not believe that our citizens will grudge the money spent upon objects of such undeniable and permanent value. The work of triangulation of the northern district of the State is now half completed. A large amount of material is ready, or nearly ready, for publication in maps. Mr. Colvin estimates that an annual appropriation of $50,000 for ten years would employ an office and field staff of about twenty trained surveyors, mathematicians, draughtsmen and clerks, and a field force of between one and two hundred assistants, rodmen, chainmen, and laborers, and would provide for the placing of monuments at township and county corners, and the perfection of the large scale assessment maps of the entire district. His estimate for 1887 is $37,850, or, if the six quarto volumes of the Adirondack survey be withheld from immediate publication, $28,850.

In reading Mr. Colvin's narrative of field-work, we are surprised to find (p. 16) an allusion to the St. Regis Indians implying that they are the last of the Iroquois. The index, indeed, refers to them in this precise phrase. It is strange that a New Yorker should be apparently ignorant that the Iroquois confederacy consisted of the Mohawks, Oneidas, Onondagas, Cayugas, Senecas and Tuscaroras, and that remnants of some of these tribes still exist within the State.

The plates accompanying this volume comprise some interesting old maps, and panoramic views of mountain scenery which tourists in the Adirondacks will find useful. We do not know why it should be the fact, but fact it is, that when one stands upon a summit, commanding a wide view of other peaks, one likes to be told their names, and thus, in some sort, to make acquaintance with them; and we have had personal reason to be grateful for some of Mr. Colvin's views, while looking upon the picturesque complexity of the Adirondack ranges.

Nickel Steel.—The Ferro-Nickel Society of Paris is making a nickel steel in the following manner: The plan has reference to a new sort of steel, which is said to require no hardening. It is composed of soft iron, nickel, manganese metal, or an oxide of it, aluminium, wolfram, and ferro-cyanide of potassium. The steel is produced at one melting. After the iron and the nickel are melted, the manganese or its oxide, together with the ferro-cyanide of potassium, are added. After a few minutes' time, during which the manganese with the other ingredients are melting and the reaction is taking place, the mass is stirred with a red-hot rod of graphite, whereupon the alluminium is added, and the stirring for a short time longer continued. The alloy is then to be well melted again, when it can be cast into any decided shape in the usual way, the precaution, however, being observed to paint the molds with coal tar, free from all water of ammonia, and to have them as free from air as possible.

THE MASON REGULATOR COMPANY'S STEAM-SAVING DEVICES.

Every user of steam recognizes the advantages and economies which would result from regulating the amount of steam supplied to an engine to the amount of work to be performed, and equalizing the pressure regardless of the pressure in the boiler. For these purposes the Mason reducing valve, pressure regulator and speed governor are used quite extensively, and with, we are assured, very satisfactory results.

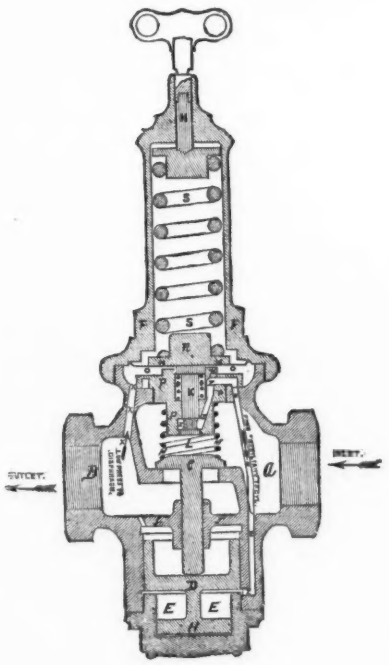
The following illustrations show these appliances :

The Mason reducing valve is designed to maintain an even steam, gas, or water pressure regardless of the initial pressure. It will reduce boiler pressure for steam-heating coils, paper-making machinery, steam laundry mangles, etc., and maintain an even pressure as low as one pound if necessary. In burning natural gas, it would apply, as it does also, in reducing the pressure in water mains. It is claimed for it that it is free from "chattering" or pounding. It needs no extra lock-up attachment, as the pressure is changed by a key. This is also an inexpensive device, costing, according to the manufacturer's card, for a one-inch pipe $22, and for a four-inch pipe $100.

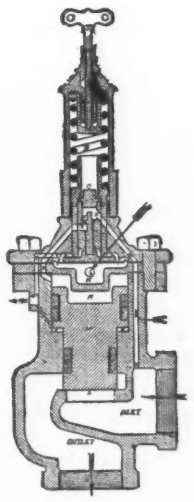
The principle upon which the Mason reducing valve is made, is that of an auxiliary valve, controlled by the low pressure, and which admits steam from the high pressure side to operate a differential piston, which is the main valve. By referring to the sectional view, it will be seen that the high pressure enters the reducing valve at the side marked "inlet," and passing through the auxiliary valve *K*, which is held open by the tension of the spring *S* passes down the port marked "from auxiliary to cylinder," underneath the differential piston *D*. By raising this piston *D*, the valve *C* is opened against the initial pressure, since the area of *C* is only one half that of *D*. Steam is thus admitted to the low pressure side, and also passes up the port *XX* underneath the phosphor-bronze diaphragm *OO*, upon which bears the spring *S*. When the low pressure in the system has risen to the required point, which is determined by the tension of the spring *S*, the diaphragm is forced upward by the steam in the chamber *OO*, the valve *K* closes, no more steam is admitted under the piston *D*, the valve *C* is forced on to its seat by the initial pressure. thus shutting off steam from the low pressure side. This action is repeated as often as the low pressure drops below the required amount. This piston *D* is fitted with a dash-pot *E*, which prevents chattering or pounding when the high or low pressure suddenly changes.

The Mason pressure regulator works on the principle of an auxiliary valve actuated by the water pressure, thereby controlling the admission of steam to the upper surface of the differential piston, which constitutes the main valve. The hydraulic pressure is admitted into the closed chamber at *O* by connection with the discharge pipe of the pump. If the pressure rises above the desired amount, the diaphragm *CC* is lifted, carrying with it the auxiliary valve *F*, and opening the passage from *X* to *Z*. This allows the steam to enter the chamber *R* on the upper and larger surface of the differential piston *M*, which is thus forced down against the boiler pressure at *L*, and completely shuts the steam off from the pump. Should the hydraulic pressure fall below the desired amount, the diaphragm is forced down by the tension of the spring *B*, the auxiliary closes ; no steam is admitted to the chamber *R*, and the piston *M* is forced open by the boiler pressure at *L*. The full head of steam is thus immediately given to the pump. The pressure can be instantly changed by the key at the top.

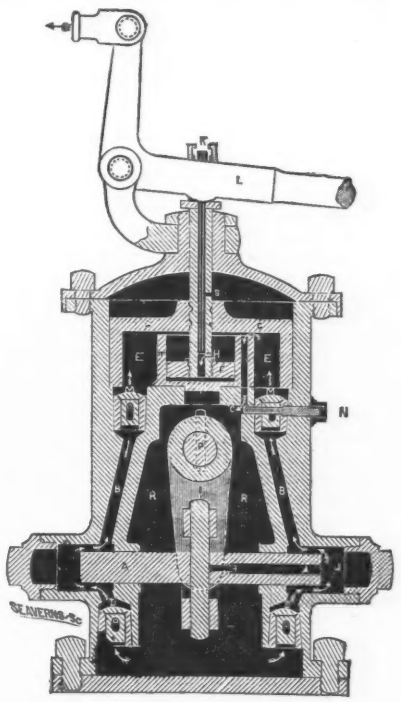
The Mason speed governor is to the direct acting steam pump what the ordinary ball governor is to the steam engine. It attaches directly to the piston rod of the pump and operates a balanced valve placed in the steam pipe, thereby exactly weighing the amount of steam to the needs of the pump. These machines are made by the Mason Regulator Company, 22 Central street, Boston, Mass.



Reducing Valve.



Pressure Regulator.



Speed Governor.

PROFIT-SHARING.

Mr. Wm. Kent, in a paper to the American Society of Mechanical Engineers, suggests the following as a fair basis for profit-sharing : From the statistics of a year's production in the establishment, make an estimate of the cost for labor and shop expenses of the articles manufactured. Call this the maximum allowable cost for the next year. Pay the men the same daily wages as before, and at the end of the year pay them in addition a certain percentage, which was agreed on in the beginning of the year, of the difference between the maximum allowable cost and the actual cost, if there has been a saving. It might be fair to deduct from the maximum cost in this calculation any saving which is clearly due to the introduction of new machinery or to the expenditure of capital, and not to increased efficiency of workmen.

The shop expenses, including rent, taxes, insurance, gas, fuel, wages of superintendents and clerks in manufacturing department, and wear and tear of machinery, are properly included in the amount upon which savings should be calculated, since if the total cost of these is a fixed sum per year, the cost per piece produced depends upon the number of pieces made, and hence to a great extent upon the efficiency of the workmen. The cost of raw material is not included, because this cost depends upon fluctuations of the market, and to some extent upon the foresight and judgment of the purchasing department, and generally not upon the efficiency of the workmen. Material spoiled by the workmen, or excessive waste of material, might, however, be charged as part of the cost of labor.

By this method of profit-sharing, the profits to be divided among the workmen are the profits which they make themselves by more rapid work, by carefulness in avoiding waste of time and material, and by general increase of skill. He shares neither the profits nor the losses of the purchasing and the selling departments, with which he has nothing to do.

Lighting Caves in Styria.—At a village in Styria there are some remarkable caves containing stalactites of great beauty. Herr Kraus, upon whose property these caves are situated, has placed a turbine in a neighboring stream, and utilizes the power to light the caves with 15 arcs. The effect produced is said to be wonderfully fine.

Asbestos Deposits in Russia.—From Orenburg to Ekaterinburg, Russia, the country is declared to be thickly dotted with asbestos deposits, while near the Verkni Tagil iron-works is a hill called the "Sholkovaya Gora," or Hill of Silk, which is stated to be largely composed of asbestos. The mineral is said to be of the best white quality, and adapted for all important purposes to which asbestos is applied. In the Goroblagsdat district of Perm, similar deposits, it is said, crop above the surface.

Estimation of Nitrates in Water by Aluminium.—The following method is suggested by Mr. S. Harvey, as the result of a great deal of study and observation : 70 c. c. of the water is mixed in a bottle with 30 c. c. of 10 per cent aqueous soda, a strip of aluminium foil, about 0·75 gramme, is put in, the bottle is closed with a stopper carrying an open tube filled with glass beads, and the whole placed under a bell jar until the reaction—which is aided by warmth—is complete. The contents and washings are made up to a definite volume, and, if possible, Nesslerised directly, otherwise they must be distilled, etc. In cases where free ammonia has to be expelled from the original water, the 70 c. c. is only made slightly alkaline at first, the 30 c. c. of soda being added subsequently. After keeping some time, a reduction in the quantity of ammonia is observed in waters which have not been previously boiled, this is presumedly due to a re-oxidation. Accurate results are obtained which are not affected by cane-sugar, or salts of iron, calcium, or magnesium.

THE MILL OF THE NORTH STAR GOLD MINE, GRASS VALLEY, CALIFORNIA.

Written for the Engineering and Mining Journal, by Frederick G. Corning, Mining Engineer.

The recent erection of a 30-stamp mill and the introduction of water as a motive power for both the mill and hoisting-works give the North Star Mining Company in respect to design, equipment, and economical working one of the most complete and perfect plants on the Pacific coast.

The plant, which was built almost entirely by the Risdon Iron and Locomotive Works, of San Francisco, consists of the following machinery: 1st, hosting engine; 2d, pumping plant; 3d, compressed air and drill plant; 4th, 30-stamp mill of the most approved California pattern; 5th, water-works and pipe system affording water power under 250 feet head to all the foregoing machinery.

With the exception of the mill, the entire plant can be run either by steam or water, and can be changed from one to the other in a few minutes' time.

The mill in particular, which is described in the following, is as near perfection as money and experience can make it. The buildings are of the most substantial nature, and are fitted with separate turbine wheels, thereby enabling each department to run independently of the other.

The tail water of the "original Empire mill and mine," the oldest going gold mining enterprise in California, is conveyed through a line of 24-inch wrought-iron pipe 10,000 feet long to the North Star mine, with a pressure of about 250 feet head. At the latter place, near the hoisting works, the 24-inch pipe branches into one line of 16½-inch pipe running to the mill below the hoisting-works, while a 14½-inch branch runs into the hoisting-works.

The pipe line is constructed of the best material, and is hydraulic riveted throughout. It is carefully coated with asphaltum and coal tar, and, with a little attention, should be as good in twenty years from now as it is to-day. Heavy material is used throughout, to allow for deterioration, and the working strain on no part exceeds 12,000 pounds per sectional inch. The line is provided with air valves, blow-off and stop valves, and also with air chambers near the works to prevent shock or jar in the pipes.

The branch running into the hoisting-works conveys the water for the motors of the hoisting and pumping machinery. These motors consist of one five-foot Pelton wheel for the hoisting machinery, equipped with deflector nozzle and a Moore's differential hydraulic gate (both being operated from the engineer's platform), and two Pelton wheels, of six feet and eight feet diameters respectively, both of which are mounted on the same shaft in a substantial framework, for the pumping machinery. This latter arrangement facilitates the changing of the pumping capacity at the shortest notice by increasing or decreasing the speed.

Below the hoisting-works and connected with the same by a substantial bridge is the thirty-stamp mill. The bridge referred to is on a level with, and is the extension of the landing platform of the hoisting-works, from which the ore is dumped into the upper part of the mill.

The ore, as it comes from the mine in cars, is trammed across the bridge and dumped over grizzlies into an ore-bin of 2000 tons capacity. The coarse raw ore which passes *over* the grizzlies accumulates in a separate bin, and is fed to two improved Blake crushers. The ore thus crushed joins the fine ore which passes the grizzlies and accumulates in the main bins which supply the stamp batteries. The latter are six in number, carrying five stamps each, with single discharge mortars, and are fed automatically by six Challenge ore feeders. The dies, shoes, tappets and cams are made of the best Pittsburg steel; and the cam shafts, each of which carry ten stamps, are of the best hammered scrap iron.

Provision has been made for ten additional stamps, for which the necessary space, power, and foundations are at hand. From the batteries the ore pulp passes through cast-iron sluice-boxes, provided with amalgamated copper plates, and thence on to shaking-tables. These shaking-tables, of which there are six (one for each battery), are 4 feet wide by 12 feet long; they are constructed entirely of wrought-iron, and are also provided with copper plates. From here the pulp is run through pipes on to twelve "Triumph" concentrators.

To facilitate and expedite cleaning up, the mill is furnished with a cleaning barrel, a batea, and a clean-up pan.

Extensions of the main mill building form the sulphuret and retort room on one side, the turbine and compressor room on another side, and a clean-up room on a third side. The clean-up room contains cast-iron cleaning tanks, covered with marble slabs, wash-stand, and clean-up pan. The compressor room contains a 14-inch by 24-inch duplex compressor and air-receiver, the latter being connected by pipes with an air-ceiver in the hoisting-works, which supplies the compressed-air drills in the mine. The wheel-house contains the water-wheels (vertical turbines) which drive the different departments of machinery as follows:

One six-foot Pelton wheel, giving motion to battery line shaft by means of four two-inch hemp ropes;

One four-foot Pelton wheel, giving motion to rock breaker counter-shaft by one 5⅝-inch wire rope;

One three-foot wheel of the same pattern, giving motion to concentrator counter-shaft by one 1¼-inch hemp rope;

One six-foot Pelton, driving 14 inches by 24 inches duplex compressors by four 2-inch hemp ropes with sheaves of different diameters for changing the speed.

The water-wheels driving the batteries and concentrator counter-shaft are each provided with hydraulic governors that are so necessary in securing the uniform operation required for efficient stamp mill and concentration work. Revolution counters are attached to the batteries and concentrators, and a hydraulic pressure gauge indicates the variations of pressure in the pipes.

The necessary mill water is drawn from a tank on the bridge level. The water from the tail race in the hoisting-works is lifted to this tank by a centrifugal pump and heated to a temperature of about 100 degrees by the introduction of a jet of steam from the boiler. From the tank, a 4-inch pipe leads the water to the mill, where it is distributed by a series of smaller pipes and valves to the batteries, concentrators and clean-up machines. The roofs of the buildings are covered with corrugated iron plates and with a number of 2½-inch fire hydrants, thus affording an excellent protection against fire.

MILLS BUILDING, New York, May, 1887.

THE PETROLEUM FIELDS OF BURMAH.

The London *Times*, in its issue of May 7th, contained a letter from a correspondent at Rangoon relative to the oil fields of Burmah, from which the following extracts are taken:

Placed beside the wells at Baku, the wells in Burmah are literally nowhere. It is right that this admission should be made at the outset, lest the erroneous conception of what a petroleum well really is here should cause dissatisfaction with the poor result that Burmah has, as yet, to show for all the labor that has been expended on the prosecution of the petroleum industry. There are two distinct oil-fields in Burmah, one on the Arakan coast, in the neighborhood of Akyab, and the other in Upper Burmah, at a place called Yenangyoung. But there are many other places where petroleum oozes out of the soil, and where it may exist in quantity. Wells have been made at Thayetmyo, the old frontier town. At Mimbu, petroleum is noticed in small quantities, in the neighborhood of the mud volcanoes. Also, it has been stated by those who went on the recent expedition to the Yaw country, to the west of the Chindwin, that petroleum was observed. But the mere fact of signs of the oil being given on the surface of the earth by no means points to any considerable quantity below. As no speculator has yet been permitted to work the Yenangyoung oil-field, its productiveness remains unknown.

There is also a great difference in the methods in use in working the low fields. In Arakan, there have been two British companies at work for some years, sinking deep wells by boring till the strata yielding the oil are reached. At Yenangyoung, the natives dig wells into which the oil oozes through the soil. In the one case, there is a bore of seven or eight inches carried down to the very source of the oil. In the other, there is a well of several feet in section, and carried down not nearly so deep. And thus the first as it reaches the source, brings forth the oil as it exists and as it was formed and sealed up in the rocks ages ago; while the second only gives an oil that has filtered through the surface soil, and may have lost a large proportion of the volatile oils in percolation.

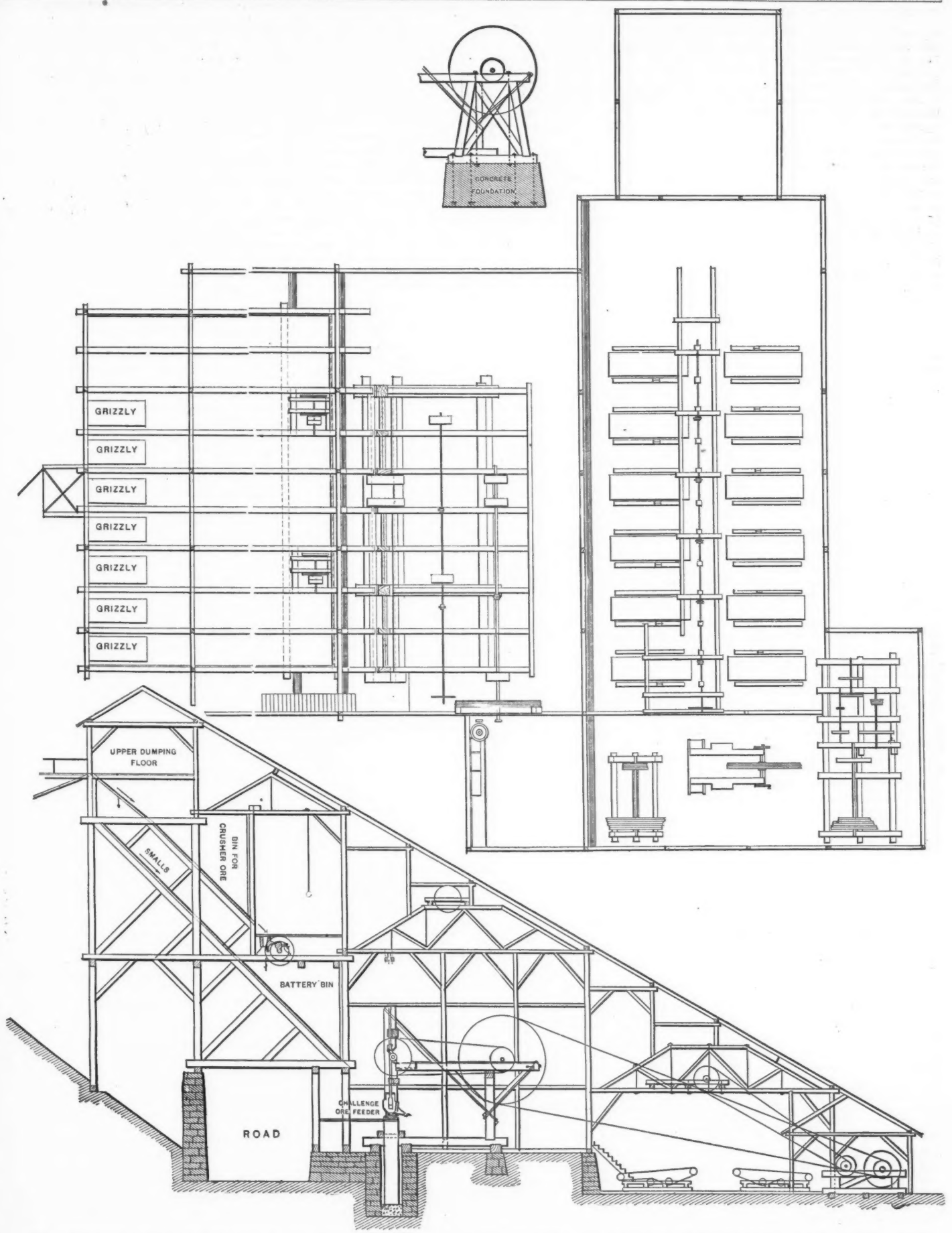
There is also a difference between the oil obtained from the Arakan field and that got from the Yenangyoung. The former yields a light limpid oil, while the latter gives the viscid, almost solid, substance known as "Rangoon oil." And of the Yenangyoung oil it may be said that it is hardly refined for light-giving oils, but for lubricating oils and for paraffine.

The difference in the mode of working does not account for the difference of the product. So far as chemical and physical properties are concerned, the petroleum of the Arakan field is very different from that of Yenangyoung. Chemists have examined the oils from the different fields throughout the world, and find that besides the hydro-carbons of the paraffine series, the old "paraffine oils," there are members of the benzol or aromatic series present in certain oils. These latter when they burn give off a black smoke, and do not suit the ordinary lamps. The Baku oil contains such substances and so does the Arakan oil. The Yenangyoung oil is likewise characterized by the presence of members of the benzol series. So that none of these oils can be considered equal in illuminative value to the oils got from America.

So much for the properties of the oil. I shall now turn to the production. At the outset of this inquiry, we must distinguish between the amount of oil actually produced and what the wells are capableof producing if properly and efficiently worked. The American oil has long been selling so very cheaply that no competition has been possible, and, of course, when it does not pay to raise and refine the oil, the industry will not be prosecuted. Machinery is dear in Burmah, and so is skilled labor, and thus there has been little to entice speculators along an utterly unknown path. In Akyab, during several years past, the wells have been worked and the oil refined, but the result has been disheartening. The companies formed have either been unsuccessful or have merely kept going without making any profit on their labors. At the commencement of the operations, about ten years ago, as much as 250 gallons a day was got from one well. Thus encouraged, the work was pro ecuted on a larger scale. Four years ago, there were twenty-four wells, ranging from 500 feet to 1200 feet in depth, from one of which, for a time, 1000 gallons a day were pumped. The company that was then working raised 334,300 gallons in a year, and refined 65,450 gallons, selling the rest in a crude state. As the price of refined oil was very low, there was a loss on the operations, and the works, as above said, have almost, if not entirely, been stopped. So long as prices are low, and the production costly, little progress can be expected in the Arakan oil industry. The Yenangyoung oil-field, being situated in upper Burmah, suffered from the misrule existing during the independence of that country, King Mendoon Min, the predecessor and reputed father of the ex-King Thebaw, made the production of earth oil a royal monopoly, and the production suffered accordingly.

There were 200 royal wells at Yenangyoung, and about as many in private hands. Many of these are not working. At present, about 200 are working. They produce about 30 tons per day per well. In the 200 referred to are included about 60 situated at Bema, in the neighborhood of Yenangyoung. Beside those already named there are two or three wells at Thayetmyo; opposite Pagan, there is another; and in the Yaw country, there are two or three shallow wells, as noticed above. The large proportion of the oil is sent down in barrels or in bulk in native boats to Rangoon. There is one refinery here, which has therefore a monopoly of the whole oil produced in Burmah. The natives in the neighborhood of the wells use a little crude oil, but the quantity bears a small proportion to the total yield.

The method of raising the oil is as follows: The wells are usually placed on the top of the hillocks that are so characteristic of the Yenangyoung district. The oil is drawn up in earthenware vessels attached to ropes. The vessel being let down into the oil which has accumulated during the night, the laborer, usually a woman, takes hold of the rope and walks down the path into the valley beneath. When the jar reaches the top it is emptied into another vessel and let down again, the woman now walking up the path till the vessel falls into the oil again and is filled. The oil is very thick as it is raised, and if the temperature of the air is below 80 degrees it becomes solid. Everything is of the most crude description, well, windlass, and method of working. The casual visitor going up and down the Irrawaddy might notice a few barrels lying on the sandy bank at the station of Yenangyoung, but would



THE NORTH STAR GOLD MILL, GRASS VALLEY, CAL.—BUILT BY THE RISDON IRON-WORKS, SAN FRANCISCO.

hardly imagine that an important oil-field lay about two miles from the bank; and, as the district is still infested by dacoits, there is little likelihood that any great change will be speedily witnessed No sooner, however, will the country be really subjugated—for the official subjugation announced in the British Parliament by Sir J. Gorst will produce little effect on the dacoits—than an attempt will be made to work the wells by the improved methods. The company that bought the oil raised by the natives during the time of native rule, has just secured the majority of the wells, and they will conduct their operations in the future on the principles of scientific working. If oil really exists in large quantity, they will reach it by sinking deep bores. But this is a question of time; and until the industry is protected from the dacoits, it is vain to hurry on the work, more especially as the price of kerosene is so low just now as to forbid the hope of any great profit even from successful working.

A feature of the oil raised in the Yenangyoung field, and one that ha. a

bearing on the source from which the oil comes, if it can only be rightly interpreted, is that it has a much higher temperature than that of the air. The oil as it rises from a well of say from 250 feet to 300 feet deep has a temperature of 90 degrees, while the temperature of the air may be only 80 degrees. It is known that after a certain depth is reached, about 60 or 70 feet, for every further descent in the earth of a similar distance the temperature rises 1 deg. Fahr. So that upon this rule the depth from which the oil comes would be about 600 feet; and if the mean annual temperature be taken the depth would seem to be even greater, according to a calculation made by Dr. Oldham some years ago, about 2870 feet. But at this point theorizing commences. What is the real cause of the high temperature of the oil? Is it due to the fact that it rises from a certain stratum having the temperature given and whose position may be assigned from the law of secular cooling of the earth? Or does it rise from some other local cause, as, for example, some chemical action going on? There are no reliable data to go on while discussing this matter. There are many hot springs and mud volcanoes in Burmah, notably at Ramree, which is not far distant from the Arakan oil region. These hot springs and mud volcanoes are usually found in the neighborhood of oil-fields. At Baku there are such; and quite recently I have read that a new one burst forth there with phenomena of great brilliance, flashing of burning gas, and the throwing up of much mud. Below the Yenangyoung oil-field there may be peculiar conditions of the strata which cause the high temperature of the oil, and which, indeed, may have ever been the original cause of the production of the oil. For this very question is still involved in obscurity.

The geological formation of the Yenangyoung oil-field is of much interest. Externally the district presents the appearance of a number of little hills deeply scarred by water-courses and cut by ravines. Except during rains, the clothing of vegetation is rather scanty. From the number of natural sections made by the ravines, it is not difficult to obtain an idea of the nature of the strata. There is a little surface clay, and after this comes tertiary sandstone and some shale. The oil is found in the soft sandstone. Below the sandstone, there seems to be shale, and from what can be gathered it seems that this shale is saturated with oil. The formation thus presented does not differ very materially from other oil-fields, except the great oil-field in America.

A distinction must be drawn between the astatki or residue of the Baku oil and the residue from Yenangyoung. The former contains only a small quantity of solid paraffine, about 2 or 3 per cent, while the latter contains as much as 14 per cent. The quantity of this substance found in the Yenangyoung oil residue renders it more valuable than the Russian. So much, however, of solid paraffine is made by the Scotch manufacturers by distillation of coal that the total amount got from the Rangoon works is hardly able to compete with it in the market. It is the residue after the extraction of the solid paraffine that is used for fuel. It is used here habitually in the oil works, but not elsewhere. The smallness of the supply prevents its being so used in other places. Fuel is very expensive on the Irrawaddy, and the attention of the government has already been turned to the examination of the coal-fields that have been reported. A geologist is now in Upper Burmah, and the field at Kalewa, on the Chindwin, which he has examined, is not hopefully reported on, for the roofing of the mine would be difficult and costly, it is said, while the quality of the coal is inferior. While it does not seem at all likely that petroleum can ever successfully compete with coal as a fuel in ordinary use, there are certain advantages possessed by petroleum that would make it cheaper than coal if its price as raised from the well would be reduced so as to be only double the price of coal.

DIVIDENDS PAID BY MINING COMPANIES DURING MAY AND FROM JANUARY 1st, 1887.

NAME OF COMPANY.	Paid in May.	Since Jan. 1.	NAME OF COMPANY.	Paid in May.	Since Jan. 1.
Adams, Colo	.....	$15,000	Mammoth, Utah	.....	$10,000
Aurora, Mich	.....	40,000	Mary Murphy, Colo	.....	52,500
Atlantic, Mich	.....	40,000	Montana, Limited, Mont	.....	204,600
Bellevue, Idaho, Idaho	.....	37,500	Moulton, Mont	$30,000	30,000
Big Bend Hydraulic, Dak	$6,000	30,000	Mount Pleasant, Cal	.....	45,000
Calumet & Hecla, Mich	.....	500,000	Ontario, Utah	75,000	375,000
Central, Mich	.....	40,000	Original, Mont	3,000	6,000
Cons. Cal. & Va., Nev	108,000	540,000	Paradise Valley, Nev	.....	10,000
Colorado Central, Colo	13,750	41,250	Parrott, Mont	.....	18,000
Daly, Utah	37,500	187,500	Plymouth Cons., Cal	25,000	125,000
Derbec Blue Gravel, Cal	10,000	10,000	Quicksilver, Cal	.....	53,750
Elkhorn, Mont	5,000	25,000	Quincy, Mich	.....	160,000
Garfield, Nev	.....	12,500	Silver King, Ariz	25,000	125,000
Granite Mountain, Mont	200,000	700,000	Small Hopes, Colo	50,000	250,000
Homestake, Dak	25,000	125,000	St. Joseph's Lead, Mo	.....	30,000
Honorine, Utah	.....	12,500	Viola, Limited, Idaho	18,750	37,500
Illinois, New Mex	.....	25,000	Yankee Girl, Colo	25,000	75,000
Iron Silver, Colo	.....	100,000			
Jumbo, Colo	5,000	10,000	Total	662,000	4,118,600
Leadville Cons., Colo	.....	20,000			

A Miner's Heroic Act.—A heroic act was performed in Coxe Brothers & Co.'s mines, at Beaver Meadow, Pa., on the 24th of May, by a miner named William Gallagher. Gallagher and Patrick Conoghan had prepared a blast, and on lighting the fuse ran for places of safety. Gallagher reached a safe place, but Conoghan fell in the manway across a drill, from which position he was unable to extricate himself. Taking in the situation at a glance, Gallagher, at the risk of his own life, ran back, and seizing the burning fuse, extinguished it. An instant later the fuse would have burned to the powder, and the explosion would have thrown Conoghan a distance of 150 feet below.

Smelting Copper with Petroleum in Siemens Radiating Furnace.—Dr. Werner Siemens' new copper works in the Caucasus have a furnace built according to the design of his brother, Herr Friedrich Siemens, and in which the heat is derived solely by radiation from petroleum and steam spray flames. These flames are not in contact with the walls of the furnace at all, and every thing depends upon radiation; but the naphtha or petroleum employed will melt from fifteen to twenty times its weight of ore. Dr. Werner Siemens says that is the first large smelting furnace in which the Siemens radiation method has been applied in practice on a large scale.

Testing Building Material.—A memoir by Professor Bauschinger, of the Technical High School, Munich, is being issued by the conference held at Dresden for obtaining information as to the various methods of testing materials used in building and construction generally. Professor Bauschinger is anxious that the object of the Dresden conference should be widely known in this country, and will be glad of any advice or co-operation that those interested may be able to give him as to how this may be best done, and also for further information as to the methods of testing materials which obtain in England.

Coal Fields of Sumatra.—It is stated that the Dutch government contemplates the construction of a railway on the island of Sumatra from Mccara Kalaban to the Bay of Brandewyns on the west coast, passing through Fort de Hock, the seat of the Dutch Government, for the purpose of utilizing the coal-fields situate along the River Umbili, which were discovered about twenty years ago. The coal is stated to be superior in quality to the best English coal, and the yield is estimated at 200,000,000 tons. The work on the railway is to extend over six years, and the cost will be about 16,000,000 florins. It is believed that the working of the coal-fields will yield an annual profit of 600,000 florins, and render Dutch India independent as regards the supply of coal.

A Great Russian Railroad Scheme.—The minister of public works in Russia is studying a plan for the construction of a railway to cross the principal chain of the Caucasus. The respective termini proposed are, in the north, the Darg-Koch station of the Vladikavkas Railway, and, in the south, the Gori station of the Transcaucasian Railway. The engineering difficulties to be encountered in the construction of the railway are immense; but like many others, equally formidable, they will doubtless be overcome. The railway will only be about 120 miles long, of which about 11 miles will be tunnels, and the expenditure is estimated, roundly, at $35,000,000, or about $290,000 per mile. It will, however, be a line of the highest military importance, and the expense will probably therefore be no consideration.

The Theory of the Telephone.—M. Corun has presented to the French Academy a memoir by M. E. Mercadier, on the theory of the telephone. M. Mercadier maintains that the transmission of articulate speech is chiefly, if not solely, the result of molecular motion in the plate of the receiver. Vibrations of the plate as a whole are only capable of yielding a single tone and its harmonics; this tone remains unaltered when the plate is supported at various points which are nodal points for this particular note; but under these circumstances the transmission of other tones is much enfeebled. Such an instrument M. Mercadier calls a mono-telephone. On the other hand, a diaphragm supported in such a manner as to be incapable of performing transversal vibration is still able to transmit speech with perfect clearness, although with considerable diminution of intensity.

The Fastest Steam Vessel.—The London *Engineer* says: The daily papers are publishing a statement leading to the notion that the fastest vessel afloat has been made by Messrs. Thornycroft & Company, who, "in making preliminary trials of a torpedo-boat built by them for the Spanish navy, have obtained a speed which is worthy of a special record. The boat is twin-screw, and the principal dimensions are:—Length, 147 feet 6 inches by 14 feet 6 inches beam, and 4 feet 9 inches draught. On a trial at Lower Hope on the 27th ult., the remarkable mean speed of 26·11 knots was obtained, being equal to a speed of 30·06 miles an hour, which is the highest speed yet attained by any vessel afloat." If our readers will turn to our last impression, they will see that Messrs. Yarrow & Company have attained as a maximum with a similar boat, a speed of 27·277 knots, or 31.44 miles per hour.

Mint Machinery for the Chinese.—As the result of arrangements made by the Chinese government with regard to the currency question, a contract has been completed with Messrs. Ralph Heaton & Son, of the Birmingham Mint, for the supply of the machinery to produce the new silver and bronze coinage. This order represents ninety coining presses and all the necessary machinery for fitting up a mint in China. The presses, which are noiseless and automatic, are capable of producing 2,700,000 coins per day of ten hours. Of these coins 100,000 are to be, if required, silver dollars. The value of the daily coinage in English money is £25,650. The extent of the undertaking is enormous, there being upwards of 400,000,000 of people for whom the greater part of the whole coinage has to be struck. In 1866, Messrs. Heaton struck for Hong Kong 80,000,000 of small bronze coins.

Copper Mining in Norway.—A foreign consul has issued a report in which he says that the principal copper ores in Norway are copper pyrites. The pyrites, which contain too little copper to be used as copper ores, were formerly valueless and were not mined. But from about 1860, when a great demand for them arose as a material in the factories of sulphuric acid, they have been worked on a large scale in Norway. The pyrites are exported in a raw condition. The largest quantities of pyrites are to be found near Trondhjem and Bergen. The Roros Works, which are Norwegian property, have been worked since 1644. With an annual production of nearly 300 tons of pure copper, they were for a number of years the most important copper works in the country, and are at present the largest mining establishment in the country but two. Two hundred and seventy men are employed there, and during the last year considerable mining of pyrites has been carried on also for exportation. The Miraker Works, in the province of North Trondhjem, produced for a number of years about 70 tons of pure copper annually. The Ytterolto Mines, also situated in the Trondhjem province, were originally worked for copper, but have later been worked on a large scale for English account for gaining pyrites for sulphur. Several mines were worked in the neighborhood of Trondhjem, especially in the Meldal, and near Bergen, the Valaheim mines, besides others were operated on a large scale for gaining copper and sulphur. The works on the Karmo Island, in the Province of Stravanger, owned by Belgians and Frenchmen, were first operated in 1865, and are now the largest mining establishment in the country, occupying about 600 workmen. The shafts have been sunk nearly 500 meters. The pyrites richest in copper are smelted on the spot into a matte containing 25 per cent of copper. More copper was, during the last few years, contained in this matte than in the aggregate production of copper from the other mines in the country (in 1882 over 400 tons of copper), but the bulk of the pyrites is exported.

THE METALLURGY OF STEEL.

By Henry M. Howe.

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(*Continued from page* 386.)

Investigating[a] the question of silicon in soft steel I find that in ordinary American Bessemer practice it rarely rises over 0·02%, and is occasionally as low as 0·004 (these extremely small amounts are rarely accurately determined). Yet this steel, practically free from silicon, with only say ·09 to ·12% carbon and with manganese ·30 to ·40% is rolled into plates as thin as No. 12 W. G., in certain cases without any edging passes, and without serious cracking. Silicon therefore is not essential to sound rolling. It was formerly thought that silicon prevented blowholes in steel by restraining the formation of carbonic oxide, silicon being oxidized in preference to carbon. But since Müller has shown that blowholes are due to nitrogen and hydrogen, we must infer that silicon acts by increasing the solubility of these gases in the solid steel, so that it is able to retain in solution while solidifying the gas which it had dissolved while molten. Silicon eliminates iron oxide from steel by reducing part of it and itself forming silica which combines with the remainder of the oxide, to form a silicate which escapes by rising to the surface more or less completely according to its condition of aggregation (cf. effects of Mn on soundness).

§ 69. FUSIBILITY.—Silicon appears to increase the fusibility of iron, though, at least when abundantly present, less than the same percentage of carbon does. Thus Mrazek found that iron with 7·4% silicon was intermediate in fusibility between steel of 0·75% carbon and cast-iron of 5% carbon. It is probable that it lowers the melting point of steel also, since the experience of the makers of open-hearth steel (say with silicon 0·15 to 0·40), is that siliciferous steel cannot in forging be safely exposed to so high a temperature as that which has but little silicon, all other conditions being alike. Further investigation may, however, show that this is merely a superstition.

FLUIDITY.—Silicon is said to give very great fluidity: hence the highly siliciferous Scotch irons are greatly prized for making fine sharp castings, and are used even for the manufacture of elaborate cast-iron jewelry, chains, brooches, etc.[b]

OXIDATION.—Silicon appears to indirectly retard the oxidation of iron at high temperatures and of the other elements combined with it. Thus Åkerman[c] points out that in the Bessemer process the more silicon the iron contains the less completely is the oxygen of the air consumed. So too siliciferous cast-irons do not sparkle while running, while if, as in Krupp's process (pig-washing) the cast-iron be almost completely deprived of its silicon, it effervesces in the air as it runs from the furnace with extreme brilliancy, which is perhaps enhanced by the reaction of small suspended particles of iron-oxide on the carbon present.

This effect of silicon is probably an indirect one: when present, by absorbing part of the oxygen to which the iron is exposed, it diminishes *pro tanto* the oxidation of carbon, restraining the formation of carbonic oxide and carbonic acid and the ebullition which their escape causes and which in itself hastens oxidation by increasing the surface exposure. Its influence on the solubility of carbonic oxide in iron may contribute to these phenomena.

[a] Trans. Am. Inst. Mining Engineers, XV., to appear.
[b] Abel, Jour. Iron and Steel Inst., 1886, I., p. 197.
[c] Engineering and Mining Journal, 1875, I., p. 311.

§ 70. THE WELDING POWER of iron and steel does not appear to be lessened more, if indeed as much, by silicon as by carbon. In addition to Mrazek's steel with 7·4% silicon and Hadfield's with over 1·5% silicon, both said to weld perfectly, we have the results obtained by the U. S. Testing Board which, in my opinion, do not indicate that silicon affects the welding power of weld iron. Of 13 irons examined, one with 0·16 silicon (the highest in silicon but 4) welded the second best. On the other hand three of the irons highest in silicon welded worst. Placing them in the order of the excellence of welding their silicon was as follows: Best welding,[d]—0·14: ·16: ·07: ·16: ·14: ·17: ·15: ·16: ·10: ·16: ·20: ·17: ·27—worst welding.

§ 71. EFFECT OF SILICON ON CAST-IRON.—Silicon affects the properties of cast-iron in two ways, by forcing carbon out of combination and into the graphitic state, and by its own direct specific effects. The latter may be traced in the changes in the properties of the metal which accompany variations in the percentage of silicon when this element does not reach an amount high enough to affect the condition of the carbon present. Under these conditions Turner's results[e] indicate that silicon makes cast-iron softer, and increases its tensile and crushing strength while lowering its specific gravity. His results are as follows:

Sp. gr.	Relative hardness.	Tensile strength. Lbs. per sq. inch.	Modulus of elasticity.	Crushing strength.	Total carbon.	Graphite.	Combined carbon.	Silicon
7·72	72·	22,720	25,790,000	168,700	1·98	0·38	1·60	0·19
7·67	52·	27,580	28,670,000	204,800	2·00	0·10	1·90	0·45
7·63	42·	28,490	31,180,000	207,300	2·09	0·24	1·85	0·96
7·47	....	31,440	23,500,000	183,900	2·21	0·50	1·71	1·37

As the silicon rises beyond 1·4 the percentage of graphite at first increases rapidly, then falls off slowly: while tensile and compressive strength both decline uninteruptedly. While experience shows that no one set of observations on the effects of foreign elements on iron is conclusive, Turner's results are so harmonious as to inspire confidence.

CHAPTER IV.

IRON AND MANGANESE.

§ 75. SUMMARY.—Manganese alloys with iron in all ratios, being reduced from its oxides by carbon at a white heat, and the more readily the more metallic iron is present to combine with it. It is easily removed from iron by oxidation, being oxidized even by silica, and partly in this way partly in others it restrains the oxidation of the iron, while sometimes restraining sometimes permitting the oxidation of the other elements combined with it. It is also apparently removed from iron by volatilization. Its presence increases the power of carbon to combine with iron at very high temperatures (say 1400° C.), and restrains its separation as graphite at lower ones. (See carbon.) By preventing ebullition during solidification and the formation of blowholes, by reducing or removing oxide and silicate of iron, by bodily removing sulphur from cast-iron and probably from steel, by counteracting the effects of the sulphur which remains as well as of iron-oxide, phosphorus, copper, silica and silicates, and perhaps in other ways, it prevents hotshortness, both red and yellow. (It does not however counteract the coldshortness caused by phosphorus.) These effects are so valuable that it is today well nigh indispensable, though admirable steel was

[d] Trans. Am. Inst. Mining Engineers, VI., p. 116. Journ. Iron and St. Inst., 1886, I., p. 174.

TABLE 20.—SPIEGELEISEN AND FERROMANGANESE.

	1.	2.	3.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.
	B	B	B	A	A	J	F	D1	A	E5	E1	E2	E3	D2	E1	C	E4	G	C	H	C	C
Carbon	4·28	4·38	4·39	4·10	4·01	3 9	4 58	4·55	4 40	2·65	4 01	5·58	5·31	1·86	6 21	6·61	6·94	6·50	.....	6 37	.....	.....
Silicon	·31	·52	·39	0·25	0 27	·5	·66	·16	0 80	10·20	·90	·06	2 52	·03	0·28	91	·02	·30	·51	·61a	·54	·31
Phosphorus	·56	·59	·52	·06	·08	·08	·64	·08	·08	·18	·24	trace	·38	·47	·06	·17	·24	·17@·20	·14	·20@·25	·17	·17
Sulphur	.....	.....	.....	·08	.03	trace	.....	·00	·01	.....	·001	trace	trace	.....	trace	·06	.....	0	.....	.....	.....	.....
Manganese	5·87	6·01	6·12	11·12	12·00	12·3	13·24	18 36	14 11	20·50	28 85	35 43	55·06	55·22	69·64	74·5	76·95	80·00	85 3	86·95	87·2	87 5
Copper	.....	.....	.....	·25	·24	.....	.....	·00	·17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

References.—A, Siegen: Jour. Iron and St. Inst., 1880, II., p. 765. B, unknown, Idem, 1886. I., p. 360. C, unknown, private notes. D1, Terre-Noire, private notes. D2, U. S., Idem E1, Reschitza. E2, Oberhausen. E3, Hoerde. E4, Ruhrort. E5, Terre-Noire, all from Ledebur, Handbuch, p. 317. F, Franklinite, New Jersey, private notes. G, Edgar Thomson steel-works, J. H. Cremer, private communication. H, the same, J. Gayley, private communication. J, Dowlais, Journ. Iron and Steel Inst., 1874, I., p. 73. a In 100 consecutive casts of ferromanganese containing over 8% manganese, the silicon averages 0·131%.

made before its use was introduced by Josiah Marshall Heath.[a]

It is thought to increase tensile strength slightly, hardness proper, and fluidity, to raise the elastic limit, and, at least when present in considerable quantity, to diminish fusibility. It is generally thought to diminish ductility: evidence will be offered tending to show that its effects in this respect have been exaggerated While 1·5 to 2·5% of manganese is nearly universally admitted to cause brittleness, steel with 8% of manganese is astonishingly ductile: with further increase of manganese the ductility again diminishes. Steel with 8 to 10% manganese, though extremely tough, is so hard as to be employed without quenching for cutting-tools. It is denied and asserted with equal positiveness that manganese confers the power of becoming harder when suddenly cooled, but it is generally thought to make steel crack when quenched.

OXIDE of manganese gives slags a strong characteristic green color and considerable fluidity, and makes them so strongly corrosive that their effect on the linings of open-hearth, cupola and other melting furnaces must be guarded against.

§ 76. COMBINING POWER.—There appears to be no limit to the extent to which manganese can combine with iron: the higher the percentage of manganese in the alloy the higher is the temperature needed in the blast-furnace for its production. These alloys contain considerable carbon, but are often almost completely free from silicon, of which they sometimes contain but 0·06%. Ferro-manganese containing more than 90% manganese often crumbles to powder in the air.

The analyses of several siliciferous ferro-manganeses are given in Table 1. Most of the compositions in Table 20 are normal.

§ 77. VOLATILITY.—Manganese appears to volatilize with considerable rapidity at a white heat. Thus Jordan[b] states that at a French blast-furnace 10% of the manganese charged could not be accounted for by the contents of metal, slag and dust. The fumes, white at first, turned red on burning. Much reddish gas escaped from the tap hole. Further, ferromanganese of 84·9% manganese lost 4% of its manganese on being exposed to the heat of a wind furnace for 2½ hours in a brasqued crucible, in which scorification can hardly have occurred.

§ 78. EFFECT ON FUSIBILITY.—A large percentage of manganese, as in ferromanganese, raises the melting point of iron: but smaller percentages may lower it, for a small addition of a less to a more fusible body (*e. g.*, of lead to tin, or silver to lead, or bisilicate of magnesia to that of lime) often produces one more fusible than either.

§ 79. MANGANESE AND BLOWHOLES.—Be it by increasing the solubility of gases in steel, so that it retains while solidifying the gas which it dissolved when molten, be it by preventing the oxidation of carbon and the formation of carbonic oxide, manganese like silicon, though probably less thoroughly, hinders the formation of blowholes. Ingots containing but ·005% of silicon and which but for manganese would be exceedingly porous, are rendered by it comparatively solid.

§ 80. MANGANESE AND OXIDATION.—As the oxidation and deoxidation of manganese in the presence of carbon and silicon will be fully discussed in a later chapter, I here confine myself chiefly to a few generalizations.

While manganese is reduced from its oxides by carbon at a white heat even in the absence of iron, thus revealing an affinity for oxygen weaker than that of silicon: yet, be it because its affinity for iron is weaker than that of silicon, be it because acid slags seize and hold its oxide, when both are combined with iron manganese is often more readily oxidized than silicon, especially in the presence of acid slags, and often causes the reduction of silicon from the walls of cupola furnaces and of crucibles.

Manganese added to molten oxygenated iron removes its oxygen as oxide or silicate of manganese. It not only thus cures but may even prevent oxygenation: in certain cases when added to molten iron it is thought to permit the oxidation of carbon and silicon while preventing that of iron, or at least preventing the redshortness which we attribute to oxygenation. So too the presence of manganese in solidified steel appears to hinder its oxygenation in heating and forging: hence an otherwise needlessly large amount of manganese (say ·5%) is often purposely left in soft steel which is liable to fall into careless hands.

Manganese appears to act upon oxygenated iron in two distinct ways, (1) by reducing iron oxide, (2) by forming a readily separating double silicate of iron and manganese: it may act in both ways simultaneously.

(1) While iron oxide if present in molten steel remains diffused or dissolved through the mass of the metal and renders it redshort, behaving as cuprous oxide does towards metallic copper, silicate and probably oxide of manganese escape from the iron by rising to the surface of the molten mass. Hence, as in the Bessemer and open-hearth processes of making steel the metal under ordinary conditions becomes slightly oxygenated, manganese is usually added at the completion of these processes, in the form of a manganiferous cast-iron (spiegeleisen, ferromanganese); it reduces the iron oxide and is itself oxidized and scorified.

It has been assumed that this reaction between the manganese and iron oxide is expressed accurately by the formula—

$$Fe_3O_4 + Mn = MnO + 3FeO.$$

and [c]Ford supports this view by showing that, assuming the unrecarburized steel to contain 0·24% oxygen as magnetic oxide, in the practice at the Edgar Thomson Steel Works the amount of manganese, 0·18%, removed from the metal corresponds closely to this formula. But this coincidence is purely accidental. Indeed, from his statement it is not clear that his assumption that the steel contained ·24% oxygen, on which the whole rests, is any

[a] Percy: Iron and Steel, p. 840.

[b] Metallurgical Review, II., p. 455. Rev. Indust., July 3, 1878.

[c] Trans. Am. Inst. Mining Engineers, IX., p. 396.

thing more than guess. It is highly probable that in the presence of so vast an excess of metallic iron the oxygen exists as ferrous rather than as magnetic oxide: moreover the quantity of manganese which is removed by the reaction varies very greatly, as will be shown by examples in due time. Further still, its removal is largely and probably chiefly due to the action, not of iron oxide contained in the metal, but of the supernatant slag. This is shown by an experiment at an American Bessemer mill, in which simply preventing the metal from coming into contact with the slag after the addition of the ferro-manganese greatly diminished the loss of manganese. In their ordinary practice on adding 1% of 80% ferromanganese to the blown steel in the ladle, 58% of the manganese thus added was removed: but in a special charge made under otherwise like conditions the steel was separated from the slag before adding the ferromanganese, by pouring it from the ladle through the nozzle in its bottom into a second ladle, in which 1% of ferromanganese was added and from which the steel was subsequently teemed into molds in the ordinary way. In this case only 21% of the manganese added was removed from the steel. I here summarize these results:

	Ferromanganese of 80% Mn added to blown steel.		Manganese removed.		Composition of steel.			
	Parts "ferro" per 100 of steel.	Manganese added per 100 of steel.	Per 100 of steel.	Per 100 of manganese added.	Carbon.	Manganese.	Silicon.	Sulphur.
Single pouring	1·	0·80	0·33	58·	·075	·336	·011	·062
Double pouring	1·	0·80	0·12	21·	·069	·638	·016	·062

Muller found that 0·354% manganese was removed in a spiegel reaction of the acid Bessemer process in which slag was present: that in the basic Bessemer process 0·389% manganese was eliminated when slag was present, but that, when the slag was wholly removed before recarburizing, only from 0 to 0·064% of manganese was expelled.[a]

(2) Manganese appears to free molten steel from minute mechanically suspended particles of slag which cause redshortness, by forming a double silicate of manganese and iron which, by coalescing more readily than the simple silicate of iron, rises more completely to the surface. Thus Pourcel[b] volatilizing by chlorine the iron of two pieces of steel, to the first of which when molten he had added silicon alone, to the second both silicon and manganese, obtains from the first a residual network of silicate of iron, while the second volatilizes completely, leaving no residuum.

This is usually confusedly explained by saying that the double silicate is more fusible than the simple one. But the simple silicates of iron, such as would form under these conditions, fuse at temperatures vastly below that of the molten steel, and if they were not melted they would still rise to the surface just as quickly as if they were. Does cork rise less rapidly through water because it is a solid? What the manganese does is either to make a silicate which is specifically lighter than the simple silicate of iron, or more probably one which more readily coalesces into globules so large that their upward motion is but little impeded by the friction of the surrounding steel.

§ 81. MANGANESE *vs.* SULPHUR.—Manganese not only counteracts the redshortness caused by sulphur but in some cases actually removes this metalloid from iron, sometimes (probably because sulphide of manganese like sulphide of calcium is less soluble in metallic iron than sulphide of iron is) by forming some compound rich in sulphur and manganese which liquates or separates by gravity, and perhaps sometimes by carrying oxygen to the sulphur. Thus Åkerman[c] quotes a manganiferous slag from a Swedish blast-furnace with 1·4% sulphur, while the accompanying cast-iron had but some hundredths of one per cent of sulphur. Parry[d] found 2% sulphur in manganiferous blast-furnace slags: when the slags were less manganiferous they contained less sulphur, while the cast-iron contained more.

Here sulphide of manganese appears to enter the slag like sulphide of lime, and like sulphide of iron, which Le Play[e] found in considerable quantities in ferruginous copper-smelting slags. Other sulphides, especially that of zinc, dissolve in slags. Åkerman considers that manganese drags sulphur into the blast-furnace slag even more powerfully than calcium does.

In three sets of experiments (1) on phosphoric, (2) on sulphurous and (3) on siliceous cast-iron respectively, each melted (A) alone and (B) with metallic manganese, Caron found that the addition of manganese energetically expelled sulphur, increased the percentage of silicon (by reducing it from the walls of the crucible) but had little effect on phosphorus. His results follow:[f]

		Phosphoric cast-iron.		Sulphurous cast-iron.		Siliceous cast-iron.	
		% phosphorus.	% manganese.	% sulphur.	% manganese.	% silicon.	% manganese.
	The initial cast-irons	0·83	.....	1·15	.....	0·99	.....
1..	The initial iron remelted without addition	0·82	.....	1·14	.....	0·88	.....
2..	The initial iron remelted with 6% metallic manganese	0·80	4 58	0·34—a	3·92	1 30	4·77
3..	No. 1 remelted a second time without further addition	0·79	.....	1·05	.....	0·80	.....
4.	No. 2 remelted a second time without further addition	0·78	3·74	0·10	2 81	1·66	2·98
5..	No. 3 remelted for the third time without further addition	0 78	.....	0·96	.....	.....	.....
6..	No. 4 remelted for the third time without further addition	0 76	1·62	0 08	1·73	.....	.....
7..	The initial iron melted with 10% ferric oxide	0·76	.....	1·08	.....	0·61	.....
8..	The initial iron melted with 10% ferric oxide and 6% metallic manganese	0 74	1·57	0·07	1·22	0·37	2·51
9..	No. 7 remelted a second time with 10% ferric oxide	.....	.....	.....	.....	0·52	.....
10..	No. 8 remelted a second time with 10% ferric oxide (no further addition of manganese)	.....	.....	.....	.....	0·18	1·10

a This figure is given in the original as 1·15: but this is evidently a misprint, as Caron remarks: "We see from these results that by a simple fusion in a crucible with access of air manganese removes more than 7-10ths of the sulphur which the cast-iron contains (on voit, d'après ces résultats que, par une simple fusion dans un creuset où l'air a accès, le manganese enlève à la fonte plus des 7-10 du soufre q'elle contient)." Nevertheless the original figure is copied, blindly it seems, in most text-books. The iron after fusion with manganese must have had less than 0·34 of sulphur, which is 3-10ths of that initially present.

E. Riley,[g] on melting a cast-iron which contained ·21% sulphur with 10% ferromanganese found that the sulphur fell to 0·035%. Percy[h] considers that the manganese, in Caron's experiments, expelled sulphur by carrying oxygen to it: while I venerate his opinions, the facts that just about enough manganese was lost to form the sulphide, MnS, with the expelled sulphur, that manganese has the power of dragging sulphur into blast-furnace slags, apparently as sulphide of manganese, very much as iron and calcium do, and that manganese and sulphur so often appear to segregate together in iron, coupled with Walrand's results incline me to believe that in Caron's case also much at least of the sulphur escaped in combination with manganese.

(TO BE CONTINUED.)

a Stahl und Eisen, 1883, pp. 446–453: idem, 1884, p. 71. Zeit. Vereins Deutsc. Ing., XXII., p. 385.

b Journ. Iron and St. Inst., 1877, I., p. 44.

c Eng. and Mining Jl., 1875, 2, p. 214.

d Percy, Iron and Steel, p. 39.

e Déscription des Procédés Métallurgiques employeés dans le Pays de Galles, p. 212.

f Comptes Rendus, LVI., p. 828, 1863.

g Journal of the Iron and Steel Institute, 1877, I., 105.

h Iron and Steel, p. 137.

PERSONALS.

Colonel James B. Andrews, of Allegheny City, Pa., it is said will be chosen successor of the late Captain James B. Eads, as engineer of the Eads Ship Railway.

F. L. Clerc, mining engineer and metallurgist, of Joplin, Mo., whose valuable, though too rare, communications are familiar to the readers of the ENGINEERING AND MINING JOURNAL, has accepted a position on government engineering work in Oregon.

Mr. William J. Harlan, well known to the anthracite coal trade, died on the 28th ult., aged sixty-three years. Mr. Harlan started in the wholesale coal business early in life, and was connected with it during the last thirty-five years. He also devoted a good deal of attention to mining engineering.

Press dispatches state "Boss" Shepherd recently met with a severe accident while riding on horseback through one of the tunnels, at Batopilas, Mexico. His horse becoming suddenly frightened at the report of a blast, in jumping caused Mr. Shepherd's head to strike against the roof of the tunnel, cutting a long deep gash. He was immediately conveyed to his residence. Erysipelas set in, and he is now lying in a very critical condition.

Baron Grant, the London mine manipulator, has come out as the proprietor of a financial paper called the *Stock Exchange*. It is rather funny to find the Baron, who has "floated" more doubtful enterprises himself than any other three men, posing as the guide, philosopher, and friend of the confiding investor. Each week some well-known company is taken, and its financial prospects minutely and exhaustively examined. The shares are shown to be worth about one half the price on the market, and no doubt Baron Grant, before issuing the paper containing the particulars, has backed his opinion by selling a goodly number. The enterprises discussed are dissected by a practiced hand.

Mr. B. F. Emerson, for ten years past the superintendent of the Copper Falls Mine, Lake Superior, died recently in Boston, where he had gone to seek the best medical assistance. He received injury at the mines by a fall from the coal bridge at the company's mill in August last, and has since been completely paralyzed in the lower part of his body. Mr. Emerson was born at Middleton, Mass., Dec. 22, 1837, and was well known and recognized as one of the ablest mining superintendents in the Lake Superior copper regions, where for the past eighteen years he had been interested in mining. In his will he made a bequest of $10,000 to the public library of Middleton, and he also gave a valuable cabinet of mineral specimens to the Michigan Mining School, at Houghton, Mich.

To Mr. J. B. Randol, manager of the New Almaden Quicksilver mines, is undoubtedly due not only the success, but the very existence, of our quicksilver mining industry in this country. Prof. S. B. Cristie, of the University of California, says: "In my judgment, but for the improvements introduced at New Almaden by Mr. Randol and his exceptionally good management, the New Almaden would, like so many other quicksilver mines, have been shut down. But for the sustaining of this mine, it is hard to tell what prices our gold miners would have to pay for foreign quicksilver produced at Almaden, Spain, or Idria, in Austria." Mr. Randol is not only an exceptionally good manager, just and generous to his employés, but he is considerate of the afflictions of miners elsewhere also. We note his recent action in starting a collection for the sufferers of the Nanaimo, B. C., disaster, and doubling himself the amount so liberally contributed by his men for this worthy cause.

We have a communication from Mr. William George, of Dover, N. J., stating that he is not the George referred to as having been indicted for embezzlement. The report reprinted in the ENGINEERING AND MINING JOURNAL last week said: "Assistant Superintendent of the Andover Iron Company, William George," while it should have read William *R.* George. Mr. George says: "About ten years ago, William R. George, who was then quite young, a son of the superintendent, was placed in a position as an assistant superintendent to help his father, Richard George, and to be trained in the way he should go. For several years, as I understand, the money passed from the treasurer into this young man's hands to pay the company's expenses, and undoubtedly whatever may be found crooked in the accounts, when the case is tried, will be found between the treasurer and William R. George, assistant superintendent, and Contractor Rosewarn. The shortage in the ore is, as I am informed, a little over 6000 tons. Why was all this ore allowed to be put in stock without weighing? "The drifts are driven all the width of the vein, 7 feet high. The average width of drift at the breast is 8 feet. The ore is a hard magnetite. Everything is broken with powder, and $15 per running yard is cheap, and miners will have to work hard or starve at that price." Our correspondent, Mr. William George, is a well-known and highly esteemed mine superintendent, and he has had nothing to do with the Andover mines for the last ten years, and is not to be charged with the shortcomings of "William R. George."

FURNACE, MILL, AND FACTORY.

The South Pittsburg Pipe-Works, Chattanooga, Tenn., made their first run last week, and will very soon enter the field of trade with a full assortment of cast water and gas-pipe.

Alfred Webb & Co. and the Southern Wire Co., Chattanooga, Tenn., have been consolidated into the Union Iron Works Co. The wire department of these works will be enlarged somewhat by the addition of wire nail machinery.

The Friedman Furnace Company contemplate building at Tuscaloosa, Ala., in connection with their furnace a large battery of coke-ovens in the near future. At present, they are constructing an experimental oven to test some of their coals.

The Birmingham Rolling Mill and Manufacturing Company has been organized at Birmingham, Ala. The concern will principally manufacture merchant bar iron, axes, edge tools, nails, chains, horseshoes and all other implements manufactured from iron and steel.

The Colorado Coal and Iron Company's No. 2 blast furnace, at Pueblo, Colo., will be ready to cast pig-iron about the first of July. The work is progressing rapidly, the only delay being caused by the slow arrival of machinery from the East. The capacity of the new furnace will be about 20 per cent greater than the No. 1, but otherwise the two will be counterparts.

The Black Diamond Steel-Works of Park Brothers & Co., Pittsburg, Pa., now have over 80 puddling and heating furnaces and 13 trains of rolls. Two of the latter are used for rolling copper. There are also 35 steam hammers and 33 shearing machines and six open-hearth steel furnaces. In the crucible line, they have two 42-pot, two 24-pot, one 30-pot, and three 48-pot Siemens steel melting furnaces, and yet they are unable to meet the demand for crucible steel. But in order to try and do so they have just leased the crucible-steel department for two years in the Fort Pitt Iron-Works, late of Graff, Bennett & Co.

The three rolling mills of the North Chicago Company, Chicago, Ill., are extremely short of coke, owing to the strikes in Pennsylvania. It is stated that the company's two mills in Chicago will shut down in about a week, and that the mill in Milwaukee can not run a much greater time. The coke strike has also affected the Union Steel Company, of Chicago, which has banked its fires. The rail mills are yet running, but as soon as the pig-iron on hand is exhausted they will close also. The Calumet Steel Company is the only prominent iron manufacturing company in that city that will not be seriously affected.

CONTRACTING NOTES.

CONTRACTS OPEN will be found on page xix. New contracts this week: No. 368, Stone, Iron, Cement, etc.; No. 369, Dredging; No. 370, Wrought-Iron Bridge; No. 371, Breakwater; No. 372, Bridge; No. 373, Cast-Iron Pipe; No. 374, Cement and Firebrick; No. 375, Boring an Artesian Well; No. 376, Pumping Engine; No. 377, Coal; No. 378, Coal; No. 379, Cast-Iron Water Pipe; No. 380, Copper, Coal, and other Supplies; No. 381, Steel Stand-Pipe, Brick Tower, and Iron Tank; No. 382, Engine, Boiler, and Elevator for Raising Crushed Stone; No. 383, Construction of Brick and Stone Sewer.

The Decatur Oil and Gas Company has contracted with Messrs. Boggs & Curtis, of Bradford, Pa., to drill a well near Decatur, Ala. to a depth of 2000 feet if necessary.

The owners of the Brennan Oil-Mill, Brennan, Texas, will contract for another boiler in connection with those now at the mill.

The Calera Land Company, Calera, Ala., has commenced work on the reservoir and wells, and is now ready to receive bids on iron pipe delivered at Calera, 6 and 4 inch.

The managers of the water-works at Dallas, Texas, expect to lay about 5 miles of 4, 6, 8, and 10-inch water mains, and have under consideration the building of two more reservoirs of 125,000,000 capacity.

The Birmingham & Atlantic Air Line Railroad Company will extend the road to Savannah, and will let out the contract to build from Macon to Savannah at once. Further particulars can be learned from Mr. R. H. Searcy, Vice-President, Griffin, Ga.

The Snead & Co. Iron-Works, of Louisville, Ky., have been awarded the contract for all the iron-work, excepting the beams, of the Chicago Auditorium, Chicago, Ill., amounting to 3600 tons of wrought and cast iron. The price is between $250,000 and $500,000. Messrs. Carnegie Bros. & Co., limited, of Pittsburg, will furnish the beams required.

All owners of building-stone quarries who choose to submit samples for the various stone-works of the Congressional Library Building, at Washington, D. C., are requested to forward the same to the Commissioner's office, No. 145 East Capitol street, prepaid and carefully packed. They should consist of four (4) one (1) inch cubes, smoothly rubbed on all sides (not polished), two (2) eight (8) inch cubes with one side quarry-faced, one side chiselled, one side hammer-dressed, one side ten (10) cut-work, one side bush-hammered, if granite, and one side polished.

LABOR AND WAGES.

The Reading Iron Company, of Reading, Penn., has announced a reduction in wages of ten per cent, to begin on June 13.

Cox Brothers & Co., coal operators at Drifton, Penn., will, it is announced, at once begin to pay their men every two weeks, in compliance with the semi-monthly pay bill passed at the last session of the Legislature.

The convention of the District Assembly No. 135, Knights of Labor, composed of miners exclusively, began a session at Cincinnati, Ohio, on the 1st inst., which will continue through several days. Fifty-three delegates from the States of Pennsylvania, Virginia, West Virginia, Ohio, Indiana, Illinois, Kentucky, Tennessee, Missouri, Alabama, Kansas, New Mexico, Colorado, Utah, Montana, and the Indian Territory are present. A prime object of the meeting will be the redistricting of the territory, and the eight-hour question and kindred matters for the benefit of miners will be discussed.

The Amalgamated Association of Iron and Steel Workers will hold their annual convention at Pittsburg, Pa., next week. The workmen have decided to ask for an advance in wages of 10 per cent, or 50 cents a ton increase over the present wages. The scale proposed is $5.50 a ton on a 2-cent card rate for puddling, and a corresponding advance in other departments. Like the present scale, the one proposed advances 10 cents for every $\frac{1}{10}$ cent advance in the card rate, but when the card rate advances from $3\frac{1}{10}$ cents to $3\frac{2}{10}$ puddling advances from $6.60 to $6.87. Several other similar jumps are made, so that the proposed price on a $4\frac{1}{2}$-cent card rate is $9.13, against $8.30, the present price. Thus the increase is 83 cents for puddling when the iron reaches this point. The manufacturers claim that the condition of trade does not warrant an increase in the scale.

Press dispatches state that all indications of an amicable settlement of the Connellsville, Pa., coke strike have failed. No agreement was reached at the conference held at Pittsburg on the 2d inst. The operators maintained that all questions at issue were fairly disposed of by the Board of Arbitration and the decision of the umpire. Under no circumstances would or could they deviate from that decision. They argued that this course was necessary to preserve the principle of arbitration in the future, and that their employés should remedy the mistake of striking in the face of the award and return to work. If this was done by the men, then they could submit their claims at a future conference, and these would be carefully and justly considered. The joint committee of the strikers, representing both labor organizations, said that they were willing to return to work at the old wages, if the syndicate reduced the price of coke to $1.50. They did not desire, however, to have it supposed that they wanted such a reduction in the selling price of coke. If coke remained at $2, they would still insist on a 12½ per cent advance in wages.

GENERAL MINING NEWS.

Shipments of iron ore from the mines of the districts mentioned below for the season up to and including the 25th of May, as reported by the Marquette *Mining Journal*, were as follows:

	Tons.
Marquette, Marquette District	69,576
St. Ignace, " "	11,912
Escanaba, " "	109,753
" Menominee District	140,341
Ashland, Gogebic District	34,558
Minnesota Iron Company, Vermillion District	20,660
Total tons	386,740

ALABAMA.

CALHOUN COUNTY.

WOODSTOCK IRON COMPANY.—The cases of R. L. Campbell *versus* the Woodstock Iron Company, at Anniston, Ala., involving an interest in the iron mines and other real estate at Anniston, was submitted to the Alabama Supreme Court on the 26th ult. Complainants' claim as stockholders of the Oxford Iron Company, asserting that the Woodstock Iron Company are the trustees in invention of the Oxford Iron Company, because they are in possession of its property. The Woodstock Iron Company claims to have purchased the complainants' stock. The amount involved is said to be several million dollars.

WALKER COUNTY.

WALKER COUNTY COAL OIL COMPANY.—This company has been organized at Birmingham, where the principal place of business will be. The object is to prospect for coal oil near Jasper, where, at a depth of fourteen feet they have soft, coarse sandstone, saturated with petroleum. This company has 160 acres of land.

ARIZONA.

GRAHAM COUNTY.

DETROIT COPPER COMPANY.—The principal mines worked at present by the company are the Copper Mountain, Yankie, Montezuma, Rynerson and Arizona Central. Work at the smelters is running smoothly. The production is about 400,000 pounds per month, or 13,000 pounds per day.

YAVAPAI COUNTY.

ST. LOUIS & YAVAPAI.—The company shipped to St. Louis last week 14,000 ounces of silver, produced during April.

CALIFORNIA.

NEVADA COUNTY.

BRUNSWICK.—Official advices to us state that the company has been vigorously at work clearing out the drain tunnel, and making connection with the drift leading up to the large pay-chute. On

the 27th ult., the superintendent wired the New York office as follows: "Tunnel in ledge three feet prospects very finely." Subsequently a telegram was received saying that the quartz contained free gold and averaged $20 per ton. An upraise has been started and sinking will commence on new shaft at once. As soon as sufficient ore is raised to justify continuous work, the mill will be started.

PLUMAS COUNTY.

CRESCENT.—The mill has started up. While crosscutting, a ledge was struck, which prospects well.

DRURY.—The Kettle mill, which has been leased by the owners of this mine, is ready for operating. Ten stamps will be started. The mill is now full of ore, and hauling will be continued.

GREEN MOUNTAIN.—It is generally understood now that this mine has superior ore, and that good returns are being obtained.

PLUMAS CONSOLIDATED —Arrangements are now making to resume operations at the mine. The legal entanglement, caused by a difference between members of the corporation, has been adjusted. Mr. S. R. Prentiss, the president of the company, is at Greenville, to supervise the affairs of the company.

CANADA.

Considerable interest is being taken in the experiments which are now making to prove the value of crude phosphate. The experiments have been attended with the most satisfactory results. Professor Shaler, of Harvard University, has had successful tests made at the Bussey Institution, and so far the most sanguine anticipations have been realized.

Reports from the mines state that the Anglo-Canadian company has put up a steam crane in a pit at the Perth mine, which is understood to have developed the best seam ever opened there. They will begin working on June 1st with a greatly increased output. Their arrangements for new machinery and improved methods have been completed.

PROVINCE OF ONTARIO.

KINGSTON & PEMBROKE MINING COMPANY.—From a circular issued by this company, to which we referred in our issues of April 9th and last week, we learn that the company has 13 distinct mining properties, located along the Kingston & Pembroke Railroad, which are being worked more or less, and are known:

1st.—*The Zanesville Glandower* property, owned in fee simple. Comprises 650 acres, from which 10,000 tons of ore have been sold. Has $20,000 worth of machinery. There are three (3) openings on this vein, covering a distance of half a mile. A large amount of ore, estimated by a conservative engineer to be 40,000 tons, is in sight in the main shaft. 2d.—*The Grady-Machar Mine.* Owned in fee simple, and comprises 100 acres, upon which there is $2000 worth of machinery. 3d.—*The Levant Mine.* Comprising 450 acres, which is leased for 99 years at a royalty of 15 cents per ton. There are three (3) shafts on this property, from which some 60,000 tons of ore have already been taken. This property contains the Wilbur mine, which produces ore lower in phosphorus than any Bessemer ore imported into the United States. There is $40,000 worth of machinery on this property. 4th.—*The Lalonde Mine.* 100 acres in fee, upon which there is $2000 worth of new and improved machinery. 5th.—*The Culhane Mine.* 100 acres in fee and $2000 in machinery. 6th.—*The Williams Mine,* 100 acres in fee and $5,000 worth of machinery. 7th.—*The Calabogie Mine.* This property is leased at a royalty of 15 cents per ton *on ore sold;* $15,000 worth of machinery. 8th.—*The "Blue" Ore Lot,* 100 acres in fee. 9th.—*The Mississippi Mine* covers one square mile, and is leased for 99 years at a royalty of 15 cents per ton on ore mined and sold. There has been 150,000 tons of ore taken from this mine thus far. The plant cost $20,000. 10th.—*The Gildersleeve Mines* comprise 1266 acres in fee and 300 acres in rights. This property contains the celebrated "Flower" mine, which is considered to be the largest mine ever found in Canada. 11th.—The company owns options on some 2600 acres of mining lands in the townships of Palmerston, Sherbrook, Bathurst, Oso, and Alden, costing already some $10,000, and which can be taken up at a cost of some $26,000 for the lot, or $1000 for 100 acres. 12th.—*The "Red Ore" Lot,* 100 acres in fee. 13th.—*The Black Lake Lot,* 100 acres in fee. The manager writes that he has just received the first report of the two cargoes of ore sent to the Joliet Steel Company. The iron is fully up to our guarantee, and the phosphorus is lower than any ore ever sent to Chicago, ·005."

COLORADO.

CHAFFEE COUNTY.

RED CLOUD CONSOLIDATED MINING AND MILLING COMPANY.—This company has been organized at St. Louis, with a capital stock of $5,000,000, shares $10 each. The property owned by the company is situated on Lost Cañon Mountain, about 3 miles west of Granite, and consists of 11 lode mining claims, 5 placer claims, and 4 mill-sites. The directors are: M. A. Wolff, M. R. Collins, Jr., George Dennison, S. F. Randolph, W. B. Swan, Robert E. Collins, and L. A. Moffatt.

CLEAR CREEK COUNTY.

KOHINOOR AND DONALDSON CONSOLIDATED MINING COMPANY.—A judgment was obtained in the County Court on the 24th ult., by James E. Lightburn and Lyne S. Newell, Jr., against this company, for $897.90.

PAY-ROCK CONSOLIDATED.—A fine vein of rich ore has been opened up in the third lift of the Cohen, Ganley & Company's lease on the Pay-Rock mine. The stopes and drifts are all in good pay. These gentlemen have been working this property for a period of four years, with good results.

CUSTER COUNTY.

SECURITY MINING AND MILLING COMPANY.—The Wet Mountain *Tribune,* in referring to the advertisements of the Security Mining Company, says: "We protest, solemnly and earnestly, that what has been done and what is now in sight, and we have seen it, does not justify any such damned lies as are being circulated by some person or persons. Newspaper men were fooled on the same property in 1879 and 1880 by lies told about the value of the ore, and it is but natural that those who knew the facts then should have suspicions about the stories that are told now."

GUNNISON COUNTY.

TOMICHI VALLEY SMELTER.—No. 2 furnace has been blown in. The supply of ore on hand and contracted for insures a steady run, so that No. 1 furnace will also shortly resume operations.

LAKE COUNTY.

ADAMS.—About two shipments per month are being made, aggregating 200 tons, just enough to pay expenses. The drift, after reaching a point within 40 feet of the west line, has been turned north to intercept the Maid of Erin ore-shoot. This drift is being driven in second contact and through a low grade sulphide mineral that will require concentration. Nothing further has been heard from the project of constructing concentration works, although tests are being made.

CLEVELAND.—The mine is showing up in a very promising manner and steadily improving. The shaft is down 135 feet, and a drift is being run on the ore-shoot. The drift has from 3 to 4 feet of mineral.

DUNKIN.—The ore in the south drift from the No. 4 shaft is greatly improving. The product recently produced has been impregnated with chlorides, and assays from $94 upward.

HENRIETT AND MAID OF ERIN MINING COMPANIES.—Steps have lately been taken looking towards a consolidation of these companies. The two properties lie adjoining one another on Carbonate Hill, and the owners of the Maid of Erin are also interested in the Henriett. For over two years both properties have been worked principally through one shaft, and a large shaft is now being sunk, which will open ore-bodies in both mines that can not be worked independent of this new improvement. During the past year, development work in the second contact has disclosed a large shoot of ore, extending from the Henriett eastward into the Maid of Erin territory.

HOUGHTON.—The drift from the Satellite shaft has encountered stringers of ore, which have increased and developed until now it appears to be a certainty that the company has cut the northern edge, or extremity, of what is known as the McKeon ore-shoot.

IRON SILVER.—The concentrating mill is now running full-time. The product of concentrates is about 40 tons per day, carrying from 15 to 30 ounces of silver and 30 per cent lead, and goes, as does the output of the mine, to the Arkansas Valley and American in equal lots. The dumps of the north and the south incline will probably keep the concentrator in operation the entire summer, and it is contemplated to prepare the mill for a winter's campaign upon the low grade mineral in the mine.

SILVER CORD.—The management has entered upon energetic working of their ground. It has now been determined to sink the main incline a distance of 400 or 500 feet further. The ground that will be reached by the extremity of this incline has been explored in a roundabout way.

SMALL HOPES.—The La Plata Smelting Company has transferred its contract with the Small Hopes for one half the output to the Harrison, and within the next day or two this product will go to the latter works. The Emmet shaft is now 680 feet, and the management expects to drive another 100 feet before striking the second contact. From a recent examination made in the Wolftone, it is calculated that the Emmet shaft is in the center of the ore-shoot as found in the Wolftone, and that 800 feet will cut it.

Tht output for May, it was estimated, would reach 2200 tons.

ST. KEVIN.—It is the intention to sink the main shaft to the depth of 375 feet and drift in under this large zone of ore and then stope to the 275-foot level.

TIP TOP AND JO DAVIS.—An arrangement has been effected between the owners of the Tip Top and the lessee of the Jo Davis by which the former takes the management of the Jo Davis, and will hereafter work the two plants in conjunction. The Tip Top will now place their pumps in the lower levels, and after a thorough overhauling is given the Jo Davis pump it will be started, and the two plants, working together under the one management, will accomplish what it seemed not possible for the two enterprises to do separately.

UNITED STATES GOLD AND SILVER MINING COMPANY.—In the United States Circuit Court, the case of Hodges *et al. vs.* United States Gold and Silver Mining Company (Little Winnie *vs.* Treasure Vault), Judge Hallett has denied the petition of plaintiffs to reinstate the case and vacate the order of dismissal.

PARK COUNTY.

ASHTABULA.—This company, which has secured possession of the mines and mills of the old Hall Valley Company, is working the Whale and other mines of the group and running the concentrating mill. Some of the ore produced is only fit for smelting, and as the company does not intend to ship any crude ore, the old smelter is being prepared for treating it.

PITKIN COUNTY.

LITTLE PERCY VS. RUBY.—Judge Rucker has denied the motion for a change of venue in the case of the Little Percy *vs.* Ruby. This is an apex-side line case, George S. Newman, *et al.,* owners of the Little Percy, and J. B. Wheeler *et al.,* owners of the Ruby.

SAN MIGUEL COUNTY.

GOLDEN CHICKEN MINING COMPANY.—This company has been organized, with the following officers: Michael Rohan, President; John S. Griffin, Vice-President; D. J. Hayden, Treasurer; and F. E. Gunn, Secretary. They will operate the Golden Chicken mine, to the sale of which we referred in our last issue. Work will be commenced at once.

DAKOTA.

LAWRENCE COUNTY.

GALENA SMELTING AND REDUCTION COMPANY.—Mr. E. A. Weinberg will be the general manager of this company. The order for the machinery was placed with Messrs Frazer & Chalmers, of Chicago.

IRON HILL.—Teams are again hauling coke to the smelter. It is now definitely settled that the new works will be blown in by the 10th of this month.

RATTLER.—The hoisting-works have been completed, and the big pump is now at work draining the mine. When this is completed, sinking will be resumed.

IDAHO.

MONTEZUMA.—William Kennedy and Dan Harrington, of Hailey, have relocated this mine, on Rock Creek, and now call it the Home Rule. The Montezuma was purchased from the original locators, about two years ago, by Superintendent Palmer, of the Minnie Moore, and Mr. Hoole, his clerk. Both are natives of England. The ground upon which the relocators expect to hold the property is that the owners, being aliens, have no right to hold unpatented mining ground in Idaho.

GUTHRIE COUNTY.

Natural gas was struck at Herndon, at a depth of 120 feet. This is the sixth well struck at this place.

LEMHI COUNTY.

VIOLA COMPANY, LIMITED.—This company has purchased the West Moreland claim, an extension of the Viola, for $10,500 cash.

INDIANA.

GRANT COUNTY.

Gas well No. 4 at Marion was drilled into the Trenton rock last week, and developed a remarkable flow of gas. The gas of well No. 4 is to be donated to enterprises locating at Marion.

MADISON COUNTY.

The gas well at Anderson, commonly known as "Vesuvius," was tested last week with a standard mercury gauge. It showed an open pressure from a 5⅝ inch casing of 4 13-16 pounds to the square inch. This indicates an output of gas of 14,061,400 cubic feet every twenty four hours. It is 830 feet deep. Well No. 1 is also a good well, with a flow of 5,000,000 cubic feet every twenty-four hours.

KENTUCKY.

HOPKINS COUNTY.

ST. BERNARD COAL COMPANY.—It is the intention not to open any new coal mines, but they expect to build a number of coke-ovens to convert the slack coal (waste) into coke, to be crushed and sold to take the place of anthracite coal.

MEXICO.

THE SMELTING COMPANY OF MEXICO.—This company has been organized in London with a capital of £120,000, shares £1 each, to carry on the business of smelting custom ores. The company intends to purchase the San Felipe Smelting Works, situated in the city of Chihuahua, the capital of the State of Chihuahua. Reports have been made by Messrs. Bainbridge, Seymour and Rathbone, consulting engineers, of London, and Mr. A. Goldschmidt, the late resident manager at the works.

MICHIGAN.

COPPER MINES.

ISLE ROYALE.—All the old machinery upon the Isle Royale mine location, in East Houghton, including both that at the mine and that at the stamp-mill, has been purchased by Mr. C. J. Hodge, of the Lake Superior Iron-Works, and is being removed to the foundry. A special meeting of the company will be held on the 19th inst., to act upon the question of extending its corporate existence, and the question of a transfer or sale of its property.

MASS.—The lessees of this mine have closed up their work. The amount of stoping ground on hand when the lessees took it was limited, and this has mostly been beat away. With the present price of copper, it will not pay to open new ground.

RIDGE.—The company will continue the present system of tribute work.

GOGEBIC RANGE.

Official advices to us report the following:

ANVIL.—This mine is showing better than ever before. There are about 15,000 tons of ore on the ore-dump, and the drifts and cross-cuts now being extended are all in clean ore. The railroad track will be completed by June 5th, when shipments will commence. In the No. 1 shaft (175 feet deep) the cross-cut went through 163 feet of ore, 130 of which carried 61·42 per cent iron and 0·022 phosphorus. Shaft No. 3 has a smaller vein, but its drifts are out for a length of 150 feet in clean ore.

BONNIE.—This mine is improving very rapidly, and

will be classed with the big mines next year. At a depth of 110 feet in one of the shafts, after running a cross-cut 43 feet through absolutely clean ore, the water came in so rapidly as to necessitate putting in a larger pump. When this has been done, the cross-cut will be continued.

EAST ANVIL, known as the "West half of the Gogebic Co."—The showing on this property is steadily improving as depth is gained. A shaft located quite near the east line of the Anvil, which is now 52 feet deep, is bottomed in excellent ore.

MISSOURI.

BARTON COUNTY.

Reports from the Golden City mining regions bring glowing accounts of rich gold finds in that vicinity. Rich placer claims are located and are said to extend for six miles. Assays made from quartz mines show from $36 to $59 per ton free milling gold. Large quantities of gray copper are found in the mines.

JASPER COUNTY.

OSWEGO.—This company is making arrangements for drilling a well for natural gas, the strike of which at this property was reported in our issue of April 23d.

NODAWAY COUNTY.

MARYVILLE COAL AND PROSPECTING COMPANY.—The Maryville Board of Trade has agreed to raise $2000, which it will turn over to the company, to be used by the latter, in addition to its own funds, in prospecting for coal and natural gas in Maryville.

MONTANA.

LEWIS & CLARKE COUNTY.

MONTANA COMPANY, LIMITED.—Official information states that the developments throughout the mine continue to be of the most satisfactory character. At the extreme south of the 400-foot level, in virgin ground, there has been struck a large body of high-grade ore. The face of the drift, on the 30th April, had penetrated this new shoot 41 feet, and a cross-cut had proved it to be at this point 25 feet in width, of which 17 feet are very high grade and 8 feet low-grade ore. A mill test of 15 tons of this high-grade ore gives a gross value of $120 per ton. Further developments made up to the 18th inst. prove the shoot to have continued unchanged since the 30th April; there are, however, indications of its decreasing in size, as reported by the resident director at the mines.

SILVER BOW COUNTY.

BLUE-BIRD.—Twenty stamps are now being added to the mill, making a total of ninety stamps and a total daily milling capacity of 120 tons.

NEVADA.

ELKO COUNTY.

COMMONWEALTH.—This property is being placed in position for active working. The ledge is a continuation of that found in the Nevada Queen and the North Belle Isle, and lies to the north of the Nevada Queen. Work will be prosecuted through the Nevada Queen by the way of the north gangway and west drift of the 200-foot level, which will tap the Commonwealth at a depth of about 350 feet and will thus drain the mine to that depth. A shaft will be sunk and drifting commenced. Work has heretofore been carried on from the surface. It is the intention of the owners to list the stock in San Francisco this month.

LAUDER COUNTY.

MANHATTAN.—Extensive developments are to be made on the company's property. They propose to run a double tracked tunnel from Clifton to the ledges in Lander Hill, says the Austin *Reveille*. The idea of such a development is identical with that of the Sutro tunnel which cuts the ledges of the Comstock lode. Such development will open up the mines at a depth of from 600 to 700 feet lower than the present workings in the deepest mines now operated by the company. The company has made extensive locations of mill and town-sites below the Clifton Depot, and intends during the summer months to erect a new and complete mill. It is then proposed to reduce all of the ores now reduced in the mill at Clifton. By so doing, the expense of hauling supplies up the heavy grade will be obviated.

PITTSBURG CONSOLIDATED GOLD MINES, LIMITED.—This company has been organized in London, with a capital stock of £80,000, shares £1 each. The company owns the Cumberland, the Lady Carrie, the Ida Henrietta and the Evening Star mines, situated near the Central Pacific Railroad; £38,334 in cash and 26,666 shares are accepted by the vendors in payment. It is stated that the property is well developed and earning profits; £15,000 of the capital of the company will be set aside to carry out improvements recommended by Mr. Moreing, and to erect a 20-stamp mill. The property was examined by Mr. C. Algernon Moreing, of Bewick & Moreing, engineers, London, in January, 1887.

STOREY COUNTY—COMSTOCK LODE.

We condense the following from the Virginia City *Chronicle*:

BALTIMORE.—The 350 level is showing a mineralized belt 50 feet in width. The rise above that level is showing ore all the way to its connection with the 250. Considerable ore is being extracted from the 450 level. The 550 level is being reopened to explore the extent of the ore development made there early in the current year.

BEST & BELCHER.—East cross-cut No. 1, known as the line cross-cut on the 1500 level in Best & Belcher, was discontinued after being advanced over 700 feet from the northeast lateral drift. The force of miners engaged in driving it was transferred to the 1300 level in the Bonner shaft, from which a northeast drift will be sent out to the north line. The failure to cut in Best & Belcher ground the southern extension of the ore development made in sinking a winze below the 1400 level in Consolidated California & Virginia, 410 feet north of the south line, indicates that the development either pinches out before reaching the south line or rises to the southward.

CONSOLIDATED CALIFORNIA & VIRGINIA.—Official reports for the week ended the 21st ult. show that 749 tons of ore were shipped to the Morgan mill, 1760 tons to the Eureka mill. The average assay value of all the ore worked at both the above mills during the same period, according to battery samples, was $32.83.

HALE & NORCROSS.—Connection has been made with the Savage shaft by the north drift on the 1200 level. This lateral drift has stripped a large area of virgin ground.

HENDRICKS.—The surface repairs are completed and work on the shaft has begun. The stock will be listed on the San Francisco boards this month. We referred to the organization of this company in our issue of April 30th.

IOWA.—The mine is showing well in all the workings, and there is a large quantity of ore ready for milling. The mill has begun operations.

NORTH OCCIDENTAL.—This mine, in Silver Star district, has been conveyed to the company incorporated under the same name for $5000. The ground adjoins the original Occidental on the north. The property is being developed by extending the main tunnel in the old Occidental into the adjoining mine.

NEW MEXICO.

GRANT COUNTY.

BREMEN.—All the men who have been at work at this mine have been discharged, except four. This move is probably due to the financial difficulties of the company referred to in our last and previous issues.

SOCORRO COUNTY.

PEACOCK.—The company has completed its new water-power arrangements and is still sinking the shaft and drifting northwest on the second level. The drift is in good ore, carrying native silver. The mill will shortly start up.

OHIO.

HAMILTON COUNTY.

At the well bored for gas at George street and Freeman avenue, Cincinnati, a strong flow of gas was obtained on the 30th ult.

MONTGOMERY COUNTY.

Strong and apparently constant flow of natural gas was struck on the 30th ult., at Miamisburg, ten miles south of Dayton. The drill is only six inches in Trenton rock.

PENNSYLVANIA.

NATURAL GAS.

A natural gas well of 250 pounds pressure was struck by Challinor, Taylor & Co., on the 28th ult., at Tarentum, at a depth of 1580 feet.

BADEN NATURAL GAS COMPANY.—This company has finished its main supply up to the Pittsburg Locomotive Works in Allegheny, and connected with the People's Pipeage Company's low-pressure lines at that point. The Pipeage Company will control the low-pressure service in Allegheny, and the Baden Company will look after the high-pressure contracts. The Baden Company will commence next week to extend its main line from Freedom to Rochester, Beaver and Bridgewater. A contract has been made with the Rochester Heat and Light Company to supply these three towns with gas furnished by the Baden. The Heat and Light Company will lay 20 miles of low-pressure pipe for the three boroughs. An arrangement has been made with the Economite Society by which the Baden Company will get the gas from the Economite's four wells. This will give the Baden nine heavy wells, in addition to eight which are now under way, and will be completed before September 1st.

PHILADELPHIA & READING COAL AND IRON COMPANY.—The gross receipts for April are $1,204,577, an increase of $110,973. The expenses were $1,170,328, a decrease of $146,681, making the net earnings $84,-071, as compared with a loss of $223,404 during April, 1886. The profit for the year to May is $84,071, against a loss of $785,234 during the corresponding period of last year.

OIL.

Exports of refined, crude, and naphtha from the following ports, from January 1st to May 28th:

	1887. Gallons.	1886. Gallons.
From Boston	1,829,130	1,890,029
Philadelphia	56,122,617	51,868,784
Baltimore	3,006,106	4,560,148
Perth Amboy	6,682,866	1,593,770
New York	139,922,123	150,347,860
Total exports	207,562,842	210,260,591

SCOTLAND.

An explosion which occurred in the Udston coal mine, eight miles from Glasgow, on the 28th ult., as reported by dispatches, buried a number of miners at work in the mine, 45 of whom were in the upper seam were rescued. The men in the lowest seam were reached too late, not one of them was found alive. The total number of lives lost is believed to be 75.

TENNESSEE.

RUTHERFORD COUNTY.

LA VERGNE MINING AND MANUFACTURING COMPANY.—This company has been organized at Nashville. The property is located at La Vergne, on the Chattanooga Railroad, 17 miles from Nashville. The business for the present will be mining iron ore and grinding metallic paints.

TEXAS.

TARRANT COUNTY.

FORT WORTH NATURAL GAS AND ARTESIAN WATER COMPANY.—This company has been organized with a capital of $25,000, and will shortly begin boring for natural gas at Fort Worth.

UTAH.

JUAB COUNTY.

BULLION-BECK & CALIFORNIA MINING COMPANY.—Mr. "Hank" Smith, for many years connected with the Comstock mines, has been appointed general manager of this company, which was recently organized by California capitalists, as mentioned in our issue of March 26th, to work the Bullion-Beck & Champion group of mines.

SALT LAKE COUNTY

CENTENNIAL EMMA MINING COMPANY.—This company has been organized in Salt Lake City, with a capital of $500,000, shares $5 each, to operate the following properties: "Centennial No. 1," also "Real Estate," "Hendrick," "Dillon," "Bradley," and "Wallace" mining claims, and has contracts for the purchase and conveyance of the "Murphy," the "Murphy No. 2," "River Lee," the "Romany," the "Calcutta," and 100 feet of the east end of the Cincinnati No. 1 and No. 3 lodes, and the Centennial and Bennett tunnels.

VERMONT.

ORANGE COUNTY.

ELY.—These copper mines, comprising 1000 acres, 100 dwellings and smelting furnaces, were sold on the 25th ult. at auction to E. P. George for taxes and a consideration of $1000.

WISCONSIN.

EAU CLAIRE COUNTY.

According to reports, arrangements have been concluded to establish smelting-works in Eau Claire, and that work will commence shortly.

GOGEBIC RANGE.

NIMIKON.—We are officially advised that a new drift and cross-cut now being run in this mine shows clean ore 27 feet wide.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, June 3d.

Statistics.

Production Anthracite Coal for week ended May 28th, and year from January 1st:

TONS OF 2240 LBS.	1887. Week.	1887. Year.	1886. Week.	1886. Year.
P. & Read. RR. Co..	†	2,873,114	155,633	4,048,906
Cent. R. R. of N. J.	88,999	1,896,183	*	*
L. V. RR. Co.	134,501	2,856,820	76,416	2,390,154
D., L. & W. RR. Co.	110,022	2,079,174	58,877	2,0.6,651
D. & H. Canal Co..	62,888	1,521,207	62,474	1,443,665
Penna. RR.	52,791	1,219,672	50,352	1,274,142
Penna. Coal Co.	31,755	558,422	21,253	475,951
Total	480,956	13,004,592	425,005	11,669,469
Increase	55,951	1,335,123	....	....
Decrease	.....	.....	....	....

* Included in tonnage of Philadelphia & Reading RR.
† Report not received.
The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

Production for corresponding period:

1882	9,520,085	1884	11,430,860
1883	11,606,453	1885	9,964,872

Production Bituminous Coal for week ended May 28th, and year from January 1st:

Tons of 2000 pounds, unless otherwise designated.

EASTERN AND NORTHERN SHIPMENTS.

	1887. Week.	1887. Year.	1886. Week.	1886. Year.
Phila. & Erie RR.	70	713	.. ...	7,464
**Cumberland, Md.*	64,429	1,095,101	59,442	458,493
Barclay, Pa.	2,693	90,342	4,463	85,924
**Broad Top, Pa.*				
H. & Broad Top RR.	6,331	155,175	9,192	160,370
East Broad Top	.....	.....	.....	.....
Clearfield Region, Pa.				
Snow Shoe	3,037	72,376	200	35,380
Karthaus (Keating)	2,819	76,676	807	49,193
Tyrone & Clearfield	71,279	1,302,925	16,675	658,333
Tipton	548	2,056	.. ...	.....
Alleghany Region, Pa.				
Gallitzin & Mountain	16,713	361,949	21,314	355,589
Pocahontas Flat Top Coal.				
Norf'k & West. RR.	19,273	469,690	14,287	332,403
Kanawha Region, W. Va.				
Ches. & Ohio RR.	†25,000	582,787	†20,000	474,087
Total	212,192	5,209,790	146,674	2,617,236

* Tons of 2240 lbs. † Estimated.

WESTERN SHIPMENTS.

Pittsburg Region, Pa.				
West Penn RR.	5,919	132,166	9,059	130,149
SouthwestPenn.RR.	1,540	61,403	3,751	84,017
Pennsylvania RR.	3,887	92,498	8,146	93,779
Westmoreland Region, Pa.				
Pennsylvania RR.	27,823	613,640	8,356	369,675
Monongahela Region, Pa.				
Pennsylvania RR.	10,946	149,739	11,844	131,114
Total	50,115	1,049,446	41,156	808,734
Grand total	262,307	6,259,236	188,330	3,425,970

Production of Coke on line of Pennsylvania RR. for week ended May 28th, and year from January 1st. Tons of 2000 pounds.

	1887. Week.	1887. Year.	1886. Week.	1886. Year.
Tyrone & Clearfield	...	1.735	.....	.....
Allegnany Region.	5,116	100.884	3.626	85,307
West Penn. RR....	2,439	46,790	1,538	4",041
Southwest Penn.RR	3,821	1,173.258	61,440	943.696
Penn. & W. Region	1,881	125.577	5,717	132.006
Monongahela	. ...	58,972	1.690	46,111
Pittsburg Region.	.....	... ...	.....	.....
Snow-Shoe..... .	907	21,688	50	9.345
Total.....	14,164	1.528,904	74.061	1.258,506

Anthracite.

Owing to a holiday on Monday, and from other causes since, the production has been moderately curtailed this week. There has been but little if any accumulation of coal in first hands for two weeks past, but we fear this condition can not last. Trade is exceedingly dull, but we do not hear of any weakness upon the part of the large companies. The smaller concerns appear to be moving their coal with moderate freedom, but generally at a concession in prices. Producers, however, take a very favorable view of the prospects for the last half of the year, and believe that in the meantime prices will be as firmly held as they have been for the past two months. We still believe that this is the time to take on liberal supplies of coal, as prices are likely to be higher later on, while vessels will not be in as abundant supply, and rates will advance.

We quote ordinary free burning coals, net, per ton, f.o.b. vessels, as follows :

Lump....	$3.40
Steamboat.....	3.40
Broken.....	3.40
Egg.....	3.60
Stove.....	3.90
Chestnut.....	3.70
Pea	3 00
Buckwheat	2.15
Dust.....	1 75

There is said to be a good demand for the small manufacturing sizes.

Bituminous.

There does not appear to have been much new business is this class of fuel during the week under review. The orders already booked appear to be absorbing most of the receipts by many shippers, and there is a decidedly hardening tendency to prices. As we stated last week, many producers are so well sold ahead and are so confident of the business of the last half of the year that they are not anxious to sell more at current prices. Some coals will readily bring from 15 to 25 cents per ton more than pool prices for moderate quantities. Upon the whole, the supply of cars on the Pennsylvania road is still inadequate. The outlook for the bituminous coal trade is certainly better than it has been for years.

Boston. June 3.

[From our Special Correspondent.]

"Things look better," say the anthracite coal jobbers at this port, and they are not an over-sanguine body of men. The continued strength of the market is having its legitimate effect of causing increased and increasing confidence in the situation. Trade is by no means active, but it is more than holding its own. The shading of circular prices by outsiders and individuals continues, but is not the factor in the market that it was a short time ago, as less coal is being offered in this way. The decision of the companies to make no change in f.o.b. prices during June is commended as good policy, jobbers being generally of the impression that trade will liven up during the month of June sufficiently to bring about a natural increase in July.

The pool in bituminous coal is working excellently. Of course, some little coal is being sold below the fixed rate of $2.60 f.o.b., but the amount so sold is very small, and is offered by a very few parties. No large contract could be placed at cut rates, the shading varying from ten cents to virtually the full pool rate. The large business is mostly upon the books of shippers by this time, but there is a good market still for scattering orders and small contracts.

I hear of cut rates on vessels not belonging to the Association every now and then, but rates are generally unchanged.

We quote, exclusive of discharging : New York, 80 @85c.; Philadelphia, $1.05; Baltimore, $1.10@$1.15; Newport News and Norfolk, $1@$1.10.

The retail market is weak-kneed as to price, and a good range is required to cover transactions. Consumers continue to buy coal in very small aggregate amounts.

We quote delivered prices as follows : White Ash Stove, $5.75@$6.25 ; Egg, $5.50@$6 ; Broken, $5.25@$5.75 ; Lorberry, $7 ; Franklin, $7.50.

Wharf prices are as follows : Broken, $4@$4.25 ; Egg, $4.50@$4.75 ; Stove, $4.75@$5.

Buffalo. June 2.

[From our Special Correspondent.]

From all outward appearances, the coal trade in bituminous and anthracite jogs along quietly and satisfactorily to dealers. As for the observations on the streets, the indications are that no orders are being filled for next winter's consumption. In the neighborhood of the docks, there is some life in the bituminous trade, for tugs must have fuel. At factories where the storage capacity is limited, may be seen the carrier delivering his load of fuel.

Manufactories are running to full capacity, and business generally is very good. But few idle men or boys are to be seen in the streets.

No change reported in coal quotations, but coke seems to be entirely nominal.

News items scarce. Vessels drawing 14 feet of water can now pass through the Welland Canal. What effect will this have on the coal trade from Lake Ontario to upper lake ports ?

There was a veritable boom in coal freights by lake during the week ; last Friday, tonnage wanted and vessels scarce, and on Saturday a 10c. rise was obtained. Last Tuesday, the demand was great and urgent, resulting in 12 vessels being chartered to Chicago and 4 to Milwaukee at a further advance of 15c., namely $1.25. One of the principal causes of the advance was the continued demand for ore tonnage, and the consequent accumulation of coal on the docks. The fleet on the spot was small, and the only way to change the order of things was done by the shippers, and that was to pay a big advance and raise the freight to the "late in the fall" rate. Grain freights from Chicago to Buffalo have increased in price for the same reason that affected the market here—the demand for ore vessels being urgent.

A year ago, freight on coal hence to Chicago was 60 cents per net ton ; now the figures are more than doubled. Yesterday a coal shipper said, "Do vessel owners want the earth ?" and the answer made by a captain was, "No, sir; we can get along better on water." Enough said.

The freight quotations on coal by lake were as follows: $1@$1.10@$1.25 to Chicago and Milwaukee ; $1.10 to Racine; $1.10@$1.25 to Green Bay; 75 cents to 85 cents to Superior, Duluth, Washburn; 35 cents to Saginaw, and 30 cents to Sandusky, Detroit and Toledo, the market closing strong.

The shipments of coal by lake from May 20th to June 1st, both days inclusive, were 57,340 net tons, namely, 19,830 to Chicago, 8100 to Milwaukee, 1700 to Green Bay, 12,550 to Duluth, 12,000 to Superior, 2080 to Toledo, 450 to Detroit, 1200 to Racine, 680 to Sandusky, and 450 to Saginaw; total for season, 349,870 tons.

Statistics show receipts of coal by lake in May, none ; shipments, 240,080 tons, as compared with 229.480 tons in 1886, and 192,240 tons in 1885. Season shipments, from opening of navigation, 349,870 tons, as compared with 301,460 tons in 1886, and 192,240 tons in 1885.

Receipts of coal by canal for week ending May 31st, 482 tons ; shipments, 147 tons. Total receipts for season 955 tons, and shipments 600 tons. Coal charters by canal from Buffalo : 1 load to Syracuse, 70c. gross ton; 1 load to Palmyra, 60c. gross ton; 1 load to Newark, N. Y., 60c. gross ton—all free on and off. Nominal rate to Albany, $1.25, and to New York, $1.75 per gross ton free on and off.

Pittsburg. June 2.

[From our Special Correspondent.]

Coal.—The market remains quiet, and will continue so until we have a rise. The coal syndicate before mentioned works well, and maintains steady prices in the lower markets. The tow-boats that went out in the last rise have returned with empties, which were forwarded to the pools to be loaded. The tow-boats will remain in port until the June rise makes its appearance. The stock in the Southern and Western markets is fair, not large, whilst previous prices were maintained. Coal prices at the tipples : First pool, 100 bushels, $4.50 ; Second pool, $4.25 ; Third pool, $3.62½ ; and Fourth pool, $3. Railroad rates, $5 per 100 bushels.

Connellsville Coke.—The second meeting of the coke men, held June 1st, failed to bring about any arrangement between the contending parties. The furnace men insist in the price of coke being $1 50, and a reduction in the freight rates on the other hand. The syndicate make no promises, and are holding a meeting to-day ; in the meantime, prices are nominal and nothing doing. Blast-Furnace, $2 f.o.b. at oven ; Foundry, $2.30; Crushed, $2.60. Freights westward and northward are : to Pittsburg, 88c. a ton; Shenango and Mahoning valleys and Wheeling, $1.65 ; Cleveland, $2.50; Chicago, $3.30; and East St. Louis, $3.85.

FREIGHTS.

The latest actual charters to June 3d, per ton of 2240 pounds :

To	From Philadelphia.	From Baltimore.	From New York shipping ports.
Alexandria.....	.65	.....	.....
Bangor.....	.....	1.15	... ..
Bath, Me.....	1.05*	1.15	.80*
Beverly	.....	.....	.80*
Boston, Mass..... ..	1.05*	1.15	.80*
Bridgeport, Conn...	.....	1.00	.....
Bristol.....	.....	1.00	...
Brooklyn	.....	1.00	.....
Cambridge, Mass...	.....	.....	.80*3c.
Cambridgeport.....	.....	.....	.80*3c.
Charleston, S. C... ..	.....	.80	.80*3c.
Chelsea.....	1.05*	.....	.80*
Com. Pt., Mass.....	.....	.....	.80*
E. Boston..	.....	... ..	.80*
Fall River.....	.....	1.00	.75
Galveston..... ..	... .	.....	.....
Gardner.....	.....	1.15	.. ...
Lynn.....	1.05*	... ..	... ...
New Bedford	.90*	1.00	.80*
Newburyport	1 05*	1.30	.95*
New Haven.....	.....	1.00	.55
New London.....	.. ..	1.00	.70
Newport.....	.....	.....	.75
New York.....	.90*	1.00	.....
Norfolk, Va.....	.50	.....	.. ..
Norwich.....	. ..	.....	.75
Norwalk.....	... .	.....	.55
Portland, Me.....	1.05*	1.15	.....
Portsmouth, N.H...	.....	1.25	.90
Providence, R. I....	.....	1.00	.75
Quincy Point.....	1.05*	.....	.. ..
Richmond, Va..	.60	.....	.....
Sag Harbor... . ..	.....	.....	.80
Salem, Mass.....	1.15*	1.00	.80*
Savannah.....	.80	.90@1.00	. ....
Somerset	.....	1.00	.....
Staten Island.....	....	1.00	.....
Wareham	.....	1.25	.....
Washington.....	.85	... ..	.....
Williamsb'g, N.Y...	.....	1.00	.....
Wilmington, N. C..	.....	.80	.....

* And discharging. † And discharging and towing. 3c. per bridge extra. § Alongside. ‖ And towing up and down. ¶ And towing. †† Pilotage. ** Below bridge. *** Old B. L.

MARKETS.

NEW YORK, Friday Evening, June 3.

Prices of Silver per ounce troy.

May	Sterling exchange	Lond'n Pence.	N. Y. Cents	Jun.	Sterling exchange	Lon d'n Pence.	N. Y. Cents
28	4.87	43⅝	95⅛	1	4.86½	43¾	95¼
30	....	....	.....	2	4.86½	†	95½
31	4.87	*	95⅛	3	4 86½	44	95¾

*43 11-16. †43 15-16.

Notwithstanding the weakness of exchange, the price of silver for the week has steadily improved, owing to decreased cash supplies.

Foreign Bank Statements.—The governors of the Bank of England, at their weekly meeting, made no change in the rate of discount, and it remains at 2 per cent. During the week, the bank gained £108,000 bullion, and the proportion of reserve to its liabilities was reduced from 47 54 to 46·44 per cent, against 36 11/16 per cent at the same time last year. The weekly statement of the Bank of France shows a loss of 1,175,000 francs gold and a gain of 1,450,000 francs silver.

Copper.—The copper market is very quiet, and though Lake copper is still quoted on the Metal Exchange at 9·25c. for spot, there has been recorded but a single sale (25,000 pounds) during the week at that figure. For futures 10¼c. is paid. None of the companies will sell below 10 cents for cash copper, and none is willing to make sales for distant delivery.

The 9·95 cent copper, which has made so much noise in the market, appears to be all—and the all has been but little—Tamarack and Osceola, and much speculation is indulged in as to the relations of the parties here who have sold it, to these companies which have allowed such a quotation. Among the suppositions made are :

1. That the brokers here are agents of the mining companies, and are selling on orders.

2. That the brokers here purchased a lot of Tamarack and Osceola copper at prices considerably above the market, and are using a little of it to "bear" the market with the hope of getting a lot of cheap copper for a rise.

3. That they have purchased the copper at "the market price," and are making the market themselves. There is no patent on either of these explanations, and our readers are free to adopt the one that suits them best. The effect to the companies has been decidedly injurious, and the influence on the market unqualifiedly bad.

The general feeling in the market is that we will before many months see considerably higher prices for copper, and these hopes and expectations are based upon our production statistics.

The estimates for our copper production this year, as compared with last year, are about as follows, in round numbers :

	1886. Gross tons.	1887. Tons.
Lake Superior	35,500	40 000
Arizona	7.000	6,000
Montana	25,000	30 000
Other States and Territories.....	1,500	2.000
	69,000	78 000
Consumption	55,500	56,000
Actually exported or to export..	19,000	22,000

These estimates put the consumption but little more than it was last year, and it leaves but about 49,000,000 lbs. for export this year, and we have already sent or sold for future delivery the greater part of this, so that even should our production get up to the figures given, and there are few who believe it will, we could export but little more than we have already contracted for.

The Old Dominion has stopped, it is said, for the balance of the year. On the other hand, the Copper Queen has started its new furnace.

It is expected that in the Lake district the Huron, the Copper Falls, and the Allouez will stop.

The Duluth Smelting-Works project seems to be going ahead, though no one appears to know exactly who is to furnish the money for it. It is generally believed that the Anaconda people are back of it in a smelting contract, if not actually as the principals. Why Duluth should be selected as a site for copper smelting-works is a still greater mystery than who is to build there.

The Sudbury has stopped shipping and is looking for ore, it having been discovered that the pyrhotite which constitutes the greater part of the deposit does not carry copper. Every one except those interested probably knew this long ago. Baltimore is selling *strictly* to manufacturers at 9¼ cents. Orford asks the same figure, and Arizona pig, of which a sale has been made during the week, is worth 8¼ cents. Chili Bars are quoted to-day in London £39 10s., an advance of 5s.

Tin.—The business done in this metal, which is nearly

all done at the Metal Exchange, has been light, and no transactions are reported except on Wednesday, when 65 tons were sold, 10 days tin, at 23⅛c., and July at 22·90c. We quote, 23@23¼c. for spot, and 22·80@22·90c. for futures. London cables to-day: Spot, £103 12s. 6d., and three months, £104 5s.

The ten-million dollar Dakota tin mine don't appear to worry any one in the business, and the statistical position abroad is strong.

Lead.—The lead market continues to advance under the absolute control of the Chicago operator, who now holds probably over 10,000 tons. Transactions have aggregated about 300 tons, at from 4·67½@4·70c., and a little is said to have sold for 4·75c.

In London, Soft Spanish is quoted to-day £12 5s., an advance of 2s. 6d. in the week, and foreign can be laid down here at 4·72½c. but the dismal experience of last year and the unstable basis of a speculative control of all the lead here will probably effectually prevent any one importing, even should the price here justify it. There appears to be nothing to prevent the great operator from holding the price at 4·70c. until manufacturers must have supplies, which for many of the largest consumers will not be for 60 days yet.

Manufactures.—Sheet lead is quoted at 7¾c. Pipe at 7c., less the usual discount of 20 per cent. Bar lead is 5¼c. Shot, 1·40c., being all as heretofore quoted.

White lead is held at 4·80@4·83c. net for Eastern brands, and 4·75c. for Western.

Messrs. John Wahl & Co., of St. Louis, telegraph to-day as follows: Lead, strong; Spot, owing to scant supply, worth 4·47½@4·50c. June and July quotable 4·45c.

Messrs. Everett & Post, of Chicago, telegraph to-day as follows: Our market has shown remarkable activity since our last advices. There has been an increased demand for spot lead for the past few days, principally from speculators, although consumers are buying where they can. Spot lead is very scarce. Market nominally 4·50, 4·55 asked.

Spelter.—There is no change in this market. Domestic is still quoted for common brands $4.50@$4.55. Silesian is quoted $4.75@$4.85 here, and £14 7s. 6d. in London.

Sheet Zinc is still in demand, and quoted 6½@6¾c.

Zinc Oxide is quoted 4@4½c., according to quality, for Domestic. French zincs are quoted 5⅝c. for Dry Antwerp Red Seal, and 7⅛c. for Dry Paris Green Seal, with the usual discounts.

Antimony.—We quote Hallett's at 7⅛@7¾c., and Cookson's 9c. Hallett's is quoted to-day in London at £31.

Quicksilver.—The market remains quiet and unchanged. We quote $42 per flask, and 52½@53c. per pound; in London, £6 15s.@£6 17s. 6d. per flask.

Nickel.—We quote 65@70c. per pound.

Aluminium—Is quoted at $1@$1.25 an ounce.

IRON MARKET REVIEW.

NEW YORK. Friday Evening, June 3.

Our excellent though somewhat bearish statistical contemporary, *Bradstreet's*, says:

"The industrial situation is less encouraging. Special advices show that fifty-three blast-furnaces, with 36,000 tons capacity weekly, have banked up owing to the coke strike, reducing bituminous iron output 42 per cent and the total iron output 25 per cent within two weeks. Many nail mills are idle, and a few iron and steel-plate mills. Ten thousand employés at the above are forced out of work, and 15,000 coal miners by the shut down of anthracite producers. In addition, 95,000 industrial employés are striking or locked out, against 50,000 one year ago. Pig-iron is steady East and at Chicago and St. Louis. Reduced output promises to help prices, as there are practically no stocks at furnaces. First signs of renewed demand, expected after July 1st, it is believed will push quotations up. Lower merchant-bar prices apply to smaller sizes, and reduced Bessemer quotations are due to slack demand and the late heavy output."

Excepting the first sentence, this is a pretty fair summary of the general situation to-day. It is somewhat notable that the continued scarcity of coke with the resulting banking of so many blast-furnaces has not appreciably affected prices of pig-iron. The Eastern furnaces using only a small percentage of coke can, of course, keep running on anthracite, of which there are very large stocks. The general outlook, in spite of strikes and all other unfavorable influences, is excellent, and the prospect of a good continued business in all departments of the iron trade remains as good as ever.

American pig-iron is firm and unchanged. Standard brands are very hard to get, and all the new business is practically in small lots of the less known brands.

Scotch irons remain very quiet with light importations, restricted mainly to the four brands which we quote below.

Bessemer pig is very dull, with no new business reported. It is probable that this article will be in better demand a little later.

There has been a decided increase in the inquiry for steel rails. Orders aggregating over 100,000 tons are now on the market, and there have been new sales amounting to 80,000 tons in the last ten days.

Steel wire rods are a little easier, although the large consumption is not abated.

The makers of structural iron are full of work, with a quantity of bridge orders ahead.

Old rails are quiet. Buyers and sellers are still apart in their views. We hear of $21 being offered and refused for 1000 tons of Tees. We also hear of about the same amount sold at about that figure. The largest importers, however, will not sell at that price, and it is likely that lots to arrive will be stored. At present, there are 6000 tons of old rails in store at this port.

The nail business looks a little better, some of the accumulated stocks having been worked off, and we hear of one nail mill which has been idle about to resume operations.

A dispatch from Pittsburg mentions the dissatisfaction of several leading firms with the new classification adopted by the trunk lines omitting from a reduction on fifth class articles hoops, band and sheet iron, fencing and plain wires, axles, springs, links, and pins. This amounts to an increase of freight on these articles, and an appeal is to be taken to the Interstate Commerce Commission.

The tendency to large combinations has been further illustrated by the formation of an association called "The Associated Dealers in Plumbers', Gas and Steam Fitters' Supplies of the Cities of New York, Brooklyn, Jersey City and Newark," in which many leading manufacturers of these articles are represented.

The following quotations are of the ruling prices:

American Pig-Iron.—No. 1 X, $20.50@$21; No. 2 X, $19.50@$20; Forge, $18@$18.50.

Scotch Pig.—Coltness, $22.00@$22.25; Clyde and Dalmellington, $20.50; Summerlee, $21.50@$21.75.

Cables to the Metal Exchange to-day quote Warrants, 41s. 10d.; Coltness, 54s.; Langloan, 50s. 6d.; Summerlee, 52s. 3d.; Gartsherrie, 48s.; Glengarnoc, 46s. 9d.; Dalmellington, 43s. 6d.; Eglinton, 43s.

Bessemer Pig.—Foreign and Domestic, $19.75@$20.

Spiegeleisen.—Foreign 20 per cent, $27@$27.50; 30 per cent, $32; Ferro, $60.

Steel Blooms.—$29@$29.50.

Steel Billets.—$30@$31.

Steel Nail Slabs.—$31@$31.50.

Steel Wire Rods.—About $40 for shipment.

Steel Rails.—Heavy sections, nominally $38@$39 at mill. Light sections, $41@$44 at mill. Foreign Rails are quoted $40 at New Orleans.

Structural Iron and Steel.—At mill: Bridge Plate, 2@2·2c.; Angles, 2·25@2·3c.; Tees, 2·7@2·8c., Steel Angles, 2·6@2·75c. From dock, Beams and Channels, 3·3c., base.

Steel Plates.—On wharf: Tank and Ship, 2·85@3c.; Boiler Shell, 3¼@3½c.; Boiler Flange, 3½@3¾c.; Boiler Fire-Box, 4@4½c.

Merchant Steel.—American Tool Steel, 7½@10c.; special grades 10@20c.; Crucible Machinery Steel, 4½@6c.; Bessemer Machinery and Spring, 2·7@3c.; Sleigh Shoe Steel, 2·4c.; Bessemer Cutlery, 3·2c.

Plate Iron.—Common Tank, 2·4@2·5c.; Refined, 2·5@2·6c.; Boiler Shell, 2·7@2·8c.; Boiler Flange, 3·7@3·8c.; Extra Flange, 4¼@4½c.

Bar Iron.—For Refined, 2·1@2·2c., base at wharf; Common, 1·9@2c., base at wharf.

Cast-Iron Pipe.—$34@$40, according to size.

Rail Fastenings.—Spikes, 2·55@2·65c., delivered; Angle Fish-Bars, 2·2@2·25c.; Bolts and Square Nuts, 3·1@3·2c.; Bolts and Hexagonal Nuts, 3·3@3·4c.

Scrap Iron.—Foreign, ex ship, at $20@$20.50; Choice No. 1, ex yard, at $23.

Old Rails.—Tees, $21@$22; Double-Heads, $22.50.

Nails—$2.10@$2.25 in carload lots.

Louisville. June 2.

[Reported by GEORGE H. HULL & Co.]

The market is again quiet, and sales during the past week have not been so large as the week previous, most of the furnaces being behind on deliveries, many of them having had to stop more or less for want of coke. Some of them have small or moderate sized lots of irregular grades that they do not sell for future delivery, but sell only as they make.

The tendency of the market is downward rather than upward. Many of the surest and far-seeing buyers, however, look for an improvement from the 1st to the 10th of July, and some are making inquiries for iron for delivery during the last six months of this year. Any little reaction in prices now would create an active demand and large purchases, and would send the market up.

We quote for cash as below:

PIG-IRON.

Southern Coke, No. 1 Foundry	$20.50@$21.00
" " No. 2 "	19 00@ 20.00
" " No. 2½ "	18.50@ 19.00
Hanging Rock Coke, No. 1 Foundry	....
Southern Charcoal, No. 1 Foundry	21.00@ 22.00
Silver Gray, different grades	17.50@ 18.00
Southern Coke, No. 1 Mill, Neutral	17.50@ 18.00
" " No. 2 " "	17.00@ 17.50
" " No. 1 Mill, Cold Short	17.50@ 18.50
" Charcoal, No. 1 Mill	18.50@ 19.50
White and Mottled, different grades	16 00@ 17.00
Southern Car-Wheel, Standard Brands	25 00@ 26.00
" " Other "	23.00@ 24.00
Hanging Rock, Cold-Blast	25.00@ 26 00
" " Warm-Blast	22.00@ 23 00

Philadelphia. June 3.

[From our Special Correspondent.]

An improvement has set in in the entire iron market, and is in harmony with the anticipations indulged in by manufacturers a month ago. The fact is proven that the consumptive requirements of the country are equal to the production, and that there is no occasion for fears as to prices being held with firmness. The general business of the country is not as voluminous as earlier in the season, but the distribution is heavy. There is less disposition to insist on extreme quotations. Things are taking shape for a good deal of business at an early day. Pig-iron is under better inquiry, and prices are firm at what may be regarded as a shading for the extreme prices of a month or six weeks ago.

The improvement in demand at the mills has overcome the unwillingness of manufacturers to cover summer requirements for gray forge. Yesterday and to day, business was done running into several thousand tons, at prices running from $16 to $18.50, and there are to-day offers made for large blocks of forge at a little below the lowest figure fixed by makers Foundry is moving just about as it has been.

Considerable business in Bessemer is under way at $20@$20.50. The inquiries cover fifteen thousand tons. Other kinds of foreign material are occasionally asked for. Muck-bars are dull because of the mill situation, though parties have made inquiries to-day. The merchant bar mills have suddenly come into possession of a good deal of business at 1·90, 2·10 rates, which leaves but little to manufacturers at present cost. Nearly all the mills have had new business, and a better feeling exists all around. The nail situation has not been changed; makers are determined to let the bushwhackers run their nails out. By that time the restriction will have reduced stocks sufficiently to maintain better prices. The sheet-iron makers report a fair amount of business. Tin plate importers are working off considerable stock. Merchant steel manufacturers are doing a fair business on their various products. Plate and tank iron has begun to move more freely, and prices are easy, $2.25@$2.35. The demand for winter rails promises to be heavy, and some makers are not quite as willing to load up at $38. Old rails afloat are quoted at $22.50@$22. Scrap yards report a revival in demand.

	$	$
Foundry No. 1	20.50@21.50	
Foundry No. 2	18.50@20 00	
Gray Forge	18.00@18.50	
Bessemer Pig	20.50@21.00	
Foreign material:		
Steel Rail Bl'ms	30.00@30.50	
Foreign Bess'r	20.50@.....	
Spiegeleisen	27.50@.....	
Scrap, Selected	23.50@.....	
No. 1	23 00@.....	
Cargo Scrap	22.00@.....	
Muck-Bars		32.50@33.00
Merchant Iron		2@2·20c.
Plate Iron		2.30@ 2.40
Tank Iron		2 30@ 2.40
Skelp Iron		2.15@.....
Structural iron:		
Angles		2.30@.....
B'ms and Chan.		3 30@.....
Nails		2.10@ 2.25
Steel Rails		39.50@41.00
Old Rails		22.00@22 50

Pittsburg. June 2.

[From our Special Correspondent.]

The iron market is certainly in a rather unsettled condition, caused by a combination of circumstances. The pig-iron men insist on a reduction in the price of coke from $2 per ton to $1.50. The meeting at the Monongahela House was largely attended, and, so far as could be judged by indications, they seem determined to remain "banked" until their demands are complied with. Most of the Western as well as the city furnaces were represented. The meeting was an harmonious one. Colonel Schoonmaker, of the coke syndicate, appeared and stated the position of the coke manufacturers in reference to the demand for lower prices. A resolution was then adopted reaffirming the former decision, that coke shall be $1.50 per ton, and also that a reduction shall be made in freight rates. The committee to arrange for the latter was continued and the association adjourned to meet on the 15th of June. The coke syndicate have held several meetings; their deliberations have not been made public. The opinion here is that there will be some kind of a compromise in the near future. The iron workers have made out their scale for the year; a ten per cent advance is asked for.

Prices of raw iron remain about the same as last week, sales being restricted to actual wants. Speculation has not been indulged in. "Storage iron" is playing a prominent part about this time. During the past thirty days there were sales amounting to 10,000 tons. We heard of a sale of 2000 tons made this week. One thing is certain, according to the sales reported, the amount remaining unsold must be small. Common or unknown brands of iron have been offered in some cases at a shade lower prices. For No. 1 Mill and Gray Forge last week's prices were maintained. Taken as a whole, the outlook is up with last week. Furnace men and others are waiting patiently to see what the negotiations now under consideration will result in.

Coke or bituminous:	$	$
Foundry No. 1	20.50@21 00	
Foundry No. 2	20.00@20.25	
Gray F., No. 2	18.50@18.75	
" " No. 4	18.00@18.25	
White	17.50@17.75	
Mottled	17.50@17.75	
Silvery	19.00@.....	
Bessemer	20.50@21.50	
Charcoal:		
Foundry No. 1	24.00@25.00	
Foundry No. 2	23.00@24.00	
Cold-Blast	26.00@29.00	
Warm-Blast	24.00@25.00	
20 p. c. Spiegel	@31.00	
Muck-Bar		31.50@32.00
Steel Blooms		32.00@33.00
Steel Slabs		31.00@33.00
Steel Crop Ends		22.50@23.00
St'l Bl'm Ends		2.200@22.50
Old Iron Rails		24.50@25 00
Old Steel Rails		24.00@24.50
No. 1 W. Scrap		@23.00
No. 2 W. Scrap		@21.00
Steel Rails		40.00@41.00
" light sect's.		40.00@44.00
Bar Iron		2.00@.....
Nails $2.15 net car lots.		
Steel Nails $2 15 net car lots.		
Two per cent off for cash.		

SALES SINCE OUR LAST REPORT.

Coke and Coal Smelted Lake Ore.

1000 Tons Bessemer at Valley Furnace	18.75 cash.
500 Tons Gray Forge	18.50 cash.
250 Tons Bessemer	21.50 cash.
100 Tons Bessemer	21.40 cash.

Coke—Native Ore.

100 Tons Gray Forge	18.25 cash.
100 Tons Gray Forge	18.50 cash.
25 Tons Gray Forge	18.75 cash.
25 Tons Foundry	20.00 cash.

Charcoal.

600 Tons No. 2 Foundry	24.00 cash.
50 Tons No. 2 Foundry	24.00 cash.
40 Tons Cold Blast	27.50 cash.

Muck Bar.

600 Tons Time Delivery	32.25 cash
500 Tons Spot	31.50 cash.

Steel Billets.

1000 Tons Imported	31.00 cash.

Steel Wire Rods.

500 Tons American	43.50 cash.

Old Iron Rails.

500 Tons Imported T's	24.50 cash

Steel Crop Ends.

100 Tons Crop Ends	22.50 cash.

FINANCIAL.

NEW YORK, Friday Evening, June 3.

The week under review has been an irregular and generally quiet one at the Stock Exchange. The transactions were reduced one and a half days by the half-holiday of last Saturday and Decoration Day on Monday. As holidays always unsettle men, the following days were quiet ones. Reading advanced, contrary to expectation, and the rest of the market acted in sympathy. Yesterday, the large accumulations of money in the Treasury and rumors that Jay Gould was seriously ill, were used as arguments for a break in prices, and the "bears" produced quite a slump. Mr. Cammack is reported to have led the movement. To-day, there was a better feeling. Some developments of a favorable character are expected in Jersey Central very shortly. Insiders having early information were buyers of the stock to-day, which accounts for the rise. The best authorities in the market are generally bullish for a long pull, and do not look for much at present, pending the completion of several important deals.

Mining Stocks.

The market was dull and featureless, and showed no signs of growing strength until yesterday, when favorable reports were received from California, which created a decidedly better feeling. Private advices from there state that prices are hard ning, and that a good upward movement may be looked for shortly. There appears to be a growing feeling in favor of mining investments, and if the market can be kept moderately clear of wildcats, mining securities may take permanent root and flourish here as legitimate and profitable investments for capital.

El Cristo is still stagnant. The view held by some is that the stock is laid on the shelf for good, while others stoutly maintain that it will ere long jump up to $10 or $12. Meanwhile, Engineer Carleton's progress is distressingly slow, and small holders are losing faith. It is announced that holders of El Cristo can exchange their stock for that of the Bocaneme Company's stock on the basis of three shares of Bocaneme stock for one of El Cristo. Both companies have placed a limited number of shares with Wells, Fargo & Company, who are offering the stock of the Bocaneme Company at $2.50 per share. The latter company's property is said to be about ten miles from the El Cristo Company's property, and has the same capitalization, $1,000,000, shares $2 each. The price of El Cristo during the week has been firm, opening at $6.50, and declining to $6, selling to-day at from $6@$6.37. There are rumors to-day on the street that "something grand" is brewing, and that "wonderful" reports have been received from the mine. At the same time, it is said that Harpending has now got nearly all the stock back and is ready for another "whirl." The lambs can walk up again and be relieved of their fleeces.

The strength in Security, which is undoubtedly fictitious, was followed on Thursday by a large "demand" for the stock, and according to the tables published by the Consolidated Exchange the trading was big. This was explained as arising from expected "big news" from the mine to be sent by the junketers on the buffet train, who went out to "inspect" the mine, and who are as competent to pass an opinion on that or any other mining property as is an Egyptian mummy. Security sales for week, 35,450 shares; price, $6.75@$7.50.

The most active stock of the week was Brunswick. We understand that additional large blocks of the stock have been purchased by careful investors in Boston, who are holding the same for much higher figures. The price has been firm and strong at from $1.40 to $1.50. Some 41,000 shares changed hands in this market. Reports from the mine state that 3 feet of $20 ore has been found in the face of the tunnel. Stanilaus holds its own at from $2 to $2.15. Quicksilver Preferred, which has of late been steadily advancing, remains firm and is selling at from $33 to $34.50. The same may be said of Plymouth Consolidated, which is now selling at $20 to $20.13, as against $15 a few months ago. Standard shows but one sale at $1.05 and Mono one at $2.75. The periodical manipulation in Middle Bar came off this week on time, and the stock was pegged up to $1 on alleged large transactions, which are well known to have been mere "wash sales." These sales amounted to 22,700 shares. Amador attracted but little attention, and sold at from $2 to $2.10.

Sutro-Tunnel has been quiet, but strong, it being known that the California crowd were in possession of more "bull tips." The price opened at 38c., and to-day is quoted at from 35@36c. Consolidated California & Virginia was again on the upward move, going from $19.75 to $24.38. The other Comstock shares receive but little attention, and show no great variation in prices. Savage sold at $5.88; Sierra Nevada at $5.50; Best & Belcher, $8.50; Mexican, $6; Union Consolidated, $4 50@$4.75.

Holders of North Belle Isle are talking very bullish, and there has been an increased demand for the stock, which has been firm at from $9.38@$9.50. Navajo, which last week sold as low as $1.05, has been selling at from $1.40@$1.50. Belle Isle has shown great activity; the price took a sudden spurt, going from 86c.@$1.30.

Alice shows but one sale at $1.35, and Moulton one at $1.50.

Phœnix is quiet, with a declining tendency. The price opened at $1.88, and went to-day from $1.63 to $1.

It is stated that foreign capitalists have increased their holdings of Colorado Central, which is now being sold at from $2.55@$2.70. Iron Silver holds its own at from $3@$3.10. Little Pittsburg shows a sale at 44c., Leadville at 64c., and Little Chief at 28c. Bassick is entirely neglected; a sale of 100 shares was made at 16c. per share.

One of the weakest stocks of the week was Santiago, which sold down to $2.85. It is said in explanation that holders of the stock are wearied of their purchases, and sacrificed the stock at best obtainable prices. It opened at $4.25 on Saturday, and has declined steadily since then.

Rappahannock is steady at from 20@21c.

The time for the exchange of the stock of the Durango Mining Company for that of the Medora Gold Mining Company has been extended to the 17th inst. We referred to this matter in our issue of May 21st.

Homestake was actively dealt in at from $15.25@$16 Caledonia only showed sales to-day at from $1.15@$1.25.

The stock of the Oneida Chief Mining Company, of California, to which we referred in our last issue, appeared on the list for the first time to-day, selling at $2.

San Sebastian continues on the downward grade, and declined from $4@$2.75. The rapid advance of this stock a few weeks ago, when it was first listed, from $3.50@$6, was too much of a good thing at once.

Renfrew and New Germany receive but little attention. The former shows one sale at $1.65, and the latter a few at from 42@43c.

Auction Sale of Stocks.

The following securities were sold at auction in this city on the 1st inst.: $100 Clearfield Bituminous Coal Corporation, series B, first mortgage 5 per cent. bond, 21; 3 shares Clearfield Bituminous Coal Corporation, preferred, 6; 1600 shares Southern Tier Mining Company, $6; $50 certificate of Knickerbocker Trust Co. for Clearfield Bituminous Coal Corporation, first mortgage bond, $4; 1000 shares Taylor Plumas Gold Mining Company, $31; 500 shares Central Arizona Mining Company, 8c. to 9c. per share.

Meetings.

The annual and special meetings of the following companies will be held at the times mentioned:

Acadia Coal Company, Limited, No. 1 Broadway, New York, June 15th, at twelve o'clock M.

Anna Gold Mining Company, office of John Hunter, Deadwood, Dak., June 14th, at two o'clock P.M.

Central Coal Company, of Pennsylvania, office of Messrs. Geo. B. Newton & Co., No. 308 Walnut street, Philadelphia, Pa., July 12th, at twelve o'clock M.

Champion Iron Mining Company, No. 37 Franklin street, Boston, Mass., June 15th, at half-past ten o'clock A.M.

Eldorado Silver Mining Company, Main street, Deadwood, Dak., June 14th, at eight o'clock P.M.

La Abra Silver Mining Company, No. 52 Exchange Place, Room 20, New York City, June 14th, at twelve o'clock M.

Monarch Gold Mining Company, office of J. K. P. Miller, Deadwood, Dak., June 14th, at two o'clock P.M.

Pennsylvania Natural Gas Company, Penn Building, 706-710 Penn avenue, Pittsburg, Pa., June 7th, at eleven o'clock A. M.

Dividends.

Consolidated California & Virginia Mining Company, of Nevada, has declared a dividend, No. 7, of fifty cents a share, or $108,000, payable June 10th, at San Francisco.

Derbec Blue Gravel Mining Company, of California, has declared a dividend of ten cents a share, or $10,000, payable May 23d, at San Francisco.

Original Mining Company, of Montana, has declared a dividend, No. 37, of five cents a share, or $3000, payable June 1st, at Butte, Monte.

Pipe Line Certificates.

Messrs. Watson & Gibson, Petroleum Brokers, 49 Broadway, report as follows for the week:

Dullness reigned supreme in the oil market, but we believe that speculators, casting about for something that has not advanced, will find in oil a splendid chance this summer. The field at Taylorstown is the most promising territory, but it is owned by a few companies who will not be anxious to break the market, even if the free drilling of that district would do it. The Ohio field is not increasing developments much, as the price there is so low—only 25 cents—and there is a growing feeling that, so far, it can not be successfully treated to make illuminating oil.

The following table gives the quotations and sales at the Consolidated Stock and Petroleum Exchange:

		Opening.	Highest.	Lowest.	Closing.	Sales.
May	28	64c.	64⅛c.	63⅛c.	63¼c.	570,000
	30	....	....	....	....	....
	31	63¼	63⅞	63¼	63¼	958 000
June	1	63¼	63⅝	62⅛	62¾	1,320.000
	2	62¾	63	62⅛	62¾	799.000
	3	62⅞	63⅜	62	63⅛	867,000
Total sales in barrels						4 514 000

Assessments.

COMPANY.	No.	When levied.	Delinquent in office.	Day of sale.	Amount.
Belt Cons., Dak	3	May 4	June 4	June 21	¼
Clipper	....	May 21	June 3	July 16	.01
Crocker, Ariz	4	May 6	June 22	July 13	15
General Crook, Dak.	4	Apr. 18	June 1	June 18	¼
Golden Fleece, Cal.	9	Apr. 26	June 3	June 30	.10
Hailey Hill, Id	....	May 6	June 10	June 29	.02
Hartshorn, Dak.	1	Mar. 26	May 21	June 10	½
Heath, Id	1	May 20	June 30	July 25	.15
Homew'd B'nd, Dak.	4	May 16	June 17	July 16	¼
Julia, Nev	22	Apr. 18	May 24	June 16	.15
Jefferson, Dak	....	May 5	June 30	July 21	.01
Keokuk, Dak	4	May 9	June 9	June 25	¼
Locomotive	....	June 1	....	....	1.00
Manhattan	....	June 1	....	....	.50
Maxfield	....	May 2	June 4	July 1	.04
Minna, Dak	5	May 13	June 21	July 10	¼
New Coso, Cal	20	Apr. 15	June 1	June 25	.10
Phil Sheridan, Nev.	1	Apr. 18	May 25	June 15	.10
Pilot Peak, Cal	15	May 7	June 20	July 18	¾
Pioche Cons., Nev.	1	Apr. 20	June 27	July 16	.60
Pocahontas, Dak	3	Apr. 11	May 15	June 5	½
Ruby Bell, Dak	3	Apr. 18	May 21	June 6	½
San Luis, Cal	9	May 19	June 19	July 8	.48
Scorpion, Nev	21	Apr. 27	June 3	June 24	.10
Sierra Nev, Nev	88	Apr. 13	May 18	June 6	.25
Silver Mt	....	May 11	June 11	July 10	12½
Transit, Dak	1	May 5	June 6	July 2	¼
Trojan, Nev	15	Apr. 29	June 2	June 30	.10
Wall St., Dak	2	Apl. 28	May 28	June 18	¼
William Penn, Cal	1	Apl. 29	June 8	June 28	.10

* The delinquent day and the day of sale were postponed to dates given above.

Boston Mining Stocks. June 2.

[From our Special Correspondent.]

The copper stocks have shown a good degree of activity the past week, and prices are very firm, with an upward tendency. The principal feature of the market was the strong buying of Osceola, which advanced from $26 to $29⅞ regular, and 30¼ buyer 60 days. The orders are said to have come from the lake, and would indicate that some progress has been made in finding the long expected Calumet vein. Whatever the cause, it is evident that the stock was wanted, and every order to buy has advanced the price steadily until to-day, when there seemed to be more stock come out than was expected, and the price dropped on the later sales to $29. Sales about 1700 shares.

Calumet & Hecla was steady on small sales at $210@$211.

Tamarack sold at $88 for small lots and $90 for 100 shares.

Quincy is firm at $49½ to $50 on light sales.

Franklin advanced to $11¾, and is quite firm.

Atlantic sold at $9, an advance of $¾ over last sale.

Kearsage sold at $6½, same as last week. Pewabic, $2¼, and Huron, $3⅛, assessment paid.

The silver stocks are quiet and prices are not materially changed. Bonanza sold at $1⅝@$1¾. Breece, 50c. Catalpa, 31@32c. Crescent, 10c. Dunkin has been dull this week and a little heavy owing to a lack of orders.

Brunswick Gold Mining Company, of California, seems to be rapidly gaining in favor, and the reports from the mine are of an exceedingly encouraging nature. The stock has sold at $1.40@$1.45, and several thousand shares have been sold in this market. An early advance in the price is predicted.

The stock of the Gogebic Development Company has been listed on the Boston Stock Exchange. The company has a capital of $5,000,000, shares $5 each, non-assessable. The company owns or controls the following properties situated on the Gogebic Iron Range: Minnewawa Iron Company, Amazon Iron Company, Old Nakomis Company, Pence Iron Company, Snider mine, Father Hennepin mine, and Trimble mine.

Baltimore Stock Quotations.

COMPANY.	Bid.	Asked.
Atlantic Coal	$1.65	$1.70@$1.80
Baltimore & N. Carolina	.59	.60@ .65
Big Vein Coal	....	$1.25
Conrad Hill	.10@ .13	.18@ .25
Diamond Tunnel	.58	.65
George's Creek Coal	79.50@80 00	90.00
Lake Chrome	.10	.20
North State (Balt.)	.57@ .58	.60@ .65
Ore Knob	.10@ .11	.13@ .14
Silver Valley	1 85	2 00

Highest and lowest prices bid and asked during the week ended June 2d.

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and amount of last		Dividends. Total paid.	Dividends. Date and amount of last.	
1	Adams, S. L.	Colo.	$1,500,000	150,000	$10	*			$555,000	Jan.	.15
2	Alice, S. C.	Mont	10.000,000	400,000	25	*			750,000	Sept	1886 .06¼
3	Alturas, G	Idah.	1,500,000	300,000	5				95,000	Sept	1886 .50
4	Amie Con., S. L.	Colo.	5,000,000	500,000	10	*			330,000	Oct.	1883 .05
5	Amy & Silversmith, S.	Mon.		341,419					264,852	Dec.	1886 .10
6	Atlantic, C.	Mich	1,000,000	40,000	25	$280,000	Apl.	1875 $1.00	360,000	Jan.	1887 $1.00
7	Argenta, S.	Nev.	10,000,000	100,000	100	295,000	July	1885 .10	40,000	Feb.	1880 .20
8	Aurora, L.	Mich.	1,000,000	40,000	25				40,000	Apl.	1887 1.00
9	Barbee & Walker, S.	Utah	1,000,000	100,000	10	*			60,000	Nov	1880 .10
10	Bassick, G. S.	Colo.	10,000,000	100,000	100	*			400,000	Mar.	1884 1.00
11	Belle Isle, S.	Nev.	10,000,000	100,000	100	160,000	Feb	1887 .20	300,000	Dec.	1879 .25
12	Belcher, G. S.	Nev.	10,400,000	104,000	100	2,217,335	ec.	1885 .30	15,397,000	Apl.	1876 1.00
13	Bellevue Idaho, S. L.	Idah.	1,250,000	125,000	10	26,250	Dec.	1883 10	200,000	Jan	1887 .10
14	Big B'nd Hydraulic, G	Dak.	1,000,000	200,000	5	*			240,000	May	1887 .03
15	Black Bear, G.	Cal..	3,000,000	30,000	100	22,500	Dec.	1884 .25	895,000	May	1883 .20
16	Bodie Con., G. S.	Cal..	10,000,000	100,000	100	374,990	Jan.	1887 .50	1,602,572	Apl.	1885 .50
17	Bonanza Developm't	C & M	3,000,000	300,000	10				135,000	Oct.	1882 .15
18	Bonanza K'g, Cons. &	Cal..	1,000,000	100,000	10	*			185,000	Feb.	1885 .10
19	Boston & Mont, G.	Mont	2,500,000	250,000	10	*			520,000	Jun	1886 .15
20	Breece, S.	Colo.	5,000,000	200,000	25	*			2,000	Feb.	1880 .01
21	Brooklyn Lead, L. S	Utah	500,000	50,000	10				102,000	Sept	1886 .05
22	Bulwer, G.	Cal	10,000,000	100,000	10	40,000	Oct.	1885 .20	175,006	Jan.	1884 .10
23	Caledonia, G.	Dak.	10,000,000	100,000	100	505,000	May	1885 .15	40,000	Feb.	1886 .10
24	Calumet & Hecla, C.	Mich	2,500,000	100,000	25	1,200,000	..		28,850,000	Mar.	1887 5.00
25	Carbonate Hill, S. L.	Colo.	2,000,000	200,000	10	*			80,000	Apl.	1884 .05
26	Caribou Con., S.	Colo.	1,500,000	150,000	10	*			50,000	Mch	1880 .10
27	Castle Creek, G.	Idah.	100 000	100,000	1				51,000	Oct.	1883 .03
28	Catalpa, S. L.	Colo.	3,000,000	300,000	10	*			270,000	May	1884 .10
29	Central, C.	Mich	500,000	20,000	25	100,000	Sept	1861 .06	1,820,000	Feb	1887 2.00
30	Christy, S.	Utah	10,000,000	100,000	100				10,000	Jun.	1885 .10
31	Chrysolite, S. L.	Colo.	10,000,000	200,000	50	*			1,660,000	Dec.	1884 .25
32	Colorado Central, S. L	Colo.	2,750,000	275,000	10	*			212,500	Jun.	1887 .05
33	Cons. Cal. & Va., G. &	Nev..	21,600,000	216,000	100	108,000	Jan.	1885 .20	712,000	Jun.	1887 .50
34	Con. Gold Mining, G.	Ga...	500,000	100,000	5	*			108,000	Nov.	1883 .02
35	Contention, S	Ariz.	12,500,000	250,000	50				2,587,000	Dec.	1884 .25
36	Crescent, S. L. G.	Utah	15,000,000	600,000	25	*			210,000	Aug.	1886 .05
37	Crown Point, G. S.	Nev..	10.000.000	100,000	100	2,675,000	Feb.	1882 .25	11,588,000	Jan.	1875 2.00
38	Daly, S. L.	Utah		150,000					187,500	May	1887 .25
39	Deadwood-Terra, G.	Dak..	5,000,000	200,000	25	*			900,00	Jan.	1884 .10
40	Derbec B. Grav., G. S.	Cal..	10,000,000	100,000	100	90,000	Dec.	1881 .10	150,000	Jun.	1887 .10
41	Dunkin, S. L.	Colo.	5,000,000	200 000	25	*			220,000	Sept	1884 .05
42	Elkhorn, G. S.	Mont	1,000,000	100,000	10	50,000	July	1883 .50	175,000	May	1887 .05
43	Eureka Con., G. S. L.	Nev..	5,000,000	50,000	100	500,000	July	1886 1.00	4,817,500	July	1882 .25
44	Evening Star, S. L.	Colo.	500,000	50,000	10	*			1,100,000	Nov	1883 .50
45	Excelsior, G.	Cal..	10,000,000	100,000	100	560,000	Sept	1885 1.00	875,000	Oct.	1880 .25
46	Father de Smet, G.	Dak.	10,000,000	100 000	100	200,000	Nov	1878 1.00	1,125,000	Dec	1885 .20
47	Franklin, C.	Mich	1,000,000	40,000	25	220,000	Jun.	1871	560,000	Dec	1886 1.00
48	Freeland, G. S. C.	Colo.	5,000,000	200,000	25	*			190,000	July	1886 .10
49	Fresno Enterprise, G	Cal..	5,000,000	100,000	50			Mch 1883 .10	110,000	July	1882 .10
50	Garfield Lt., G. S	Nev.	500,000	100,000	5				25,000	Mar.	1885 .12½
51	Gould & Curry, G. S.	Nev..	10,800,000	108,000	100	4,109,000	Mar.	1887 .50	3,826,000	Oct.	1870 10.00
52	Grand Central, S.	Ariz.	1,000,000	100,000	10				625,000	Dec	1882 .25
53	Grand Prize, S.	Nev..	10,000,000	100,000	100	570, 00	Apl.	1886 .50	495,000	Mar.	1884 .25
54	Granite, S.	Colo.	125,000	125,000	1				6,250	May	1883 .01
55	Granite Mountain, S.	Mont	10,000,000	400,000	25				2,500.000	Jun.	1887 .50
56	Green Mountain, G.	Cal..	1,250,000	125,000	10	*			212,000	Nov.	1881 .07½
57	Hale & Norcross, G. S	Nev..	11,200,000	112,000	100	5,030,800	Mar.	1887 .50	1,598,000	Apl	1871 5.00
58	Hall-Anderson, G.	N. S.	150,000	150,000	1				7,000	Jan.	1882 .05
59	Hecla Con., S. G. L. C	Mont	1,500,000	30,000	50				1,047,000	Aug	1886 .50
60	Hel'a Mg & Red, G. S. L	Mont	3,315,000	663,000	5	*			197,973	July	1886 .06
61	Holmes, S.	Nev..	10,000,000	100,000	100	300,000	Sept	1885 10	75,000	Apl.	1886 .25
62	Holyoke, G.	Idah.	200,000	200,000	1				27 000	Feb.	1883 .10
63	Homestake, G.	Dak.	12,500,000	125,000	100	200,000	July	1878 1.00	3,818,750	May	1887 .20
64	Honorine, S. L.	Utah	500,000	250,000	2	25,000	Jun.	1883	100,000	Apl.	1887 .05
65	Hope, S.	Mont	400,000	8.000	50	*			158,252	Oct.	1884 1.50
66	Horn-Silver, S. L.	Utah	10,000,000	400,000	25	*			4,00.000	Nov	1884 .50
67	Idaho, G.	Cal..	310,000	3,100	100				2,339,500	Apl	1887 5.00
68	Ideal, S. L.	Colo.	1,500,000	150,000	10				15,000	Oct.	1886 .05
69	Illinois, S.	N. M.	100,000	100,000	1	*			25,000	Jan	1887 .25
70	Independence, S.	Nev..	10,000,000	100,000	100	340,000	Oct.	1886 .20	225,000	Sept	1879 .25
71	Indian Queen, S.	Nev..	250,000	125,000	2				368,750	July	1883 .03
72	Inyo, G.	Cal..	500,000	100,000	5	*			45,000	Apl.	1882 .05
73	Iron Hill, S.	Dak.	2,500,000	250,000	10	82,500	Oct.	1885	112.500	Oct.	1886 .05
74	Iron-Silver, S. L.	Colo.	10,000,000	500,000	20	*			2,000,000	Jun.	1887 .20
75	Jackson, G. S.	Nev.	5,000,000	50,000	100	10,000	Nov.	1880 .20	45,000	Oct.	1886 .10
76	Jocuistita, S.	Mex.	2,500,000	250,000	10				1,20 ,000	Feb.	1886 .50
77	Jumbo, G.	Colo.	2,000,000	200,000	10	*			10.000	May	1887 .02½
78	Kentuck	Nev..	3,000, 00	30,000	100	342,000	Nov	1881 .30	1,600,000	Dec.	1882 .10
79	La Plata, S. L.	Colo.	2,000,000	200,000	10	*			810,000	Sept	1882 .30
80	Leadville Cons., S. L.	Colo.	4,000,000	400,000	10	*			435,000	Apl	1887 .05
81	Lexington, G. S.	Mont	4,000,000	40,000	100	*			565,000	Jan.	1885 2.00
82	Little Chief, S. L.	Colo	14,000,00	200,000	50	*			780,000	Mar	1885 .10
83	Little Pittsburg, S. L	Colo.	20,000,000	200,000	100	*			1,050,000	Mch.	1880 .50
84	Manhattan, S.	Nev	5,000,000	50,000	100	250,000	Mar	1887 1.00	437,500	Feb	1886 .25
85	Marguerite, G.	Cal..	500,000	25,000	20				18.750	Oct.	1882 .25
86	Marion Bullion, G	N.C.	500,000						15.000	Jan.	1886
87	Martin White, S.	Nev..	10,000,00	100,000	100	1,150,000	Mar.	1886 25	140,000	Dec.	1886 .25
88	Mary Murphy, G. S.	Colo.	350,000	3,500	100	*			70,000	Apl.	1887 5.00
89	Minnesota, C.	Mich	1,000,00	40,000	25	420,000	Apl	1886 1 00	1,826,000	Mar.	1876
90	Mono, G.	Colo.	5,000,000	50,000	100	585,000	Mar	1887 .50	12.500	Mar.	1886 .25
91	Montana, Lt., G. S.	Mont	3,300,00	330,000	10	*			999,900	Jan.	1887 .62
92	Morning Star, S. L.	Colo.	1,000,00	100,000	10				675,000	Dec.	1886 .25
93	Moulton, S. G.	Mont	2,000,000	400,000	5	*			350,000	May	1887 .07½
94	Mount Pleasant, G.	Cal.	150,000	150,000	1	*			150.000	Feb.	1887 .30
95	Mt. Diablo, S.	Nev	5,000,000	50,000	100	137,500	Jun	1880 2.00	80,000	July	1885 .20
96	Napa, G	Cal..	700,000	100,000	7				290,000	Jan.	1883 .10
97	Navajo, G. S.	Nev..	10,000,000	100,000	100	450,000	Mar.	1887 .30	325,000	Feb.	1885 .25
98	N. Hoover Hill, G. S.	N. C.	300,000	120,000	2½				30,000	Dec.	1885 .00¾
99	New York Hill, G.	Cal.	5,000,00	50,000	100	62,500	Oct	1885 .15	215,000	Aug.	1882 .10
100	Northern Belle, S.	Nev..	5,00 0,000	50,000	100	425,000	Jan	1884 8.00	2,400,000	Apl	1883 .50
101	North Belle Isle, S.	Nev..	10,000,000	100,000	100	250,000	Mar	1887 .50	93,000	Aug.	1881 .15
102	Ontario, S. L.	Utah	15,000,000	150,000	100				8,300,000	May	1887 .50
103	Opnir, G. S.	Nev..	10,000,000	100,000	100	4,007,800	Dec.	1886 .50	1,595,000	July	1882 1.00
104	Original, S. C.	Mont	1,500,000	60,000	25	*			123.000	Jun.	1887 .05
105	Osceola, C.	Mich	1,250,000	50,000	25	480,000	Apl.	1876 1.00	1,022,500	Jan.	1887 1 00
106	Oxford, G.	N. S.	125,000	125,000	1	*			34,500	Oct.	1886 .02
107	Paradise Valley, G. S	Nev.	10,000,000	100,000	100	47,000	Mar.	1882 .15	150,000	Apl.	1887 .10
108	Parrott, C.	Mont	1,800,000	180,000	10				18,000	May	1887 .10
109	Peacock, S. G. C.	N. M.	2,000,000	200,000	10	*			60,000	Nov.	1886
110	Pleasant Valley, G. S.	Cal..	10,000,000	100,000	100	40,000	Mar.	1884 .10	30,000	Dec.	1882 .05
111	Plutus, G. S. C. L	Colo.	2,000,000	200,000	10	*			20.000	Feb.	1886 .10
112	Plymouth Con., G.	Cal..	5,000,000	100,000	50	*			1,975,000	Jun.	1887 .25
113	Prussian, S. L.	Colo.	1,500,000	150,000	10				132,000	Jan	1885 .10
114	Quicksilver, pref., G	Cal..	4,300,000	43,000	100				849,650	Jan.	1887 1.50
115	" com., G.	Cal	5,700,000	57,000	100				151,000	July	1886 .40
116	Quincy, C.	Mich	1,000,000	40,000	25	200,000	Dec.	1863	4,57 ,000	Jan	1887 4.00
117	Ricamond, S. L.	Nev..	1,350,000	54,000	25	*			4,245,087	Dec.	1886 1.25
118	Ridge, C.	Mich.	500,000	20,000	25	220,000	Mar	1886 .50	10 ,000	Feb.	1880 .50
119	Rising Sun, S.	Dak..	750,000	150,000	5	*			52,000	May	1881 .07½
120	Robinson Con., S. L.	Colo.	10,000,000	200,000	50	*			565,000	Mar.	1886 .05
121	Robert E. Lee, S. L.	Colo	10,000,000	500,000	20				100,000	Dec.	1882 .10
122	Rooks, G.	Vt..	500,000	50,000	10	*			61,000	Apr.	1885 .30
123	San Francisco, C.	Cal..	5,000,000	50,000	100	45,000	Sept	1881 .50	20,000	Feb.	1884 .05
124	Savage, S.	Nev..	11,200,000	112,000	100	6,212,000	Mar.	1887 .50	4,460,000	July	1869 3.00
125	Security L. Mg., Mfg.	Colo.	1,000,000	100,000	10	*			50,000	July	1884
126	Shoshone, G.	Idah.	150,000	150,000	1				7,500	Apl.	1883 .01
127	Sierra Buttes, G.	Cal..	225,000	22,500	10				1,438,934	Oct.	1886 .37
128	Sierra Grande, S.	N. M.	2,500,000	500,000	5				860,000	Sept	1884 .25
129	Sierra Nevada, G. S.	Nev..	10,000,000	100,000	100	6,257,000	Apl.	1887 .50	102,000	Jan.	1871 1.00
130	Silver Cord, G. S. L.	Colo.	5,000,000	500,000	10				225,000	Nov.	1883 .25
131	Silver King, S.	Ariz.	10,000,000	100,000	100				1,925,000	Apl.	1887 .25
132	Silverton, G. S. L.	Colo.	2,000,000	200,000	10	*			76.000	Nov	1886 .02
133	Small Hopes Cons., S.	Colo.	5,000,000	250,000	20	*			2,762,500	May	1887 .20
134	Smuggler, S. L.	Colo.	600,000	60,000	10				66,700	Aug.	1883 .25
135	Socorro, S.	N. M.	250,000	5,000	100				4,000	Mch	1882 .00¾
136	South Yuba, G.	Cal..	2,000,000	0,000	50	*			150,000	Oct.	1881 .75
137	Spring Valley, G.	Cal..	200,000	200,000	1	50,000	Oct.	1886 .25	50,000	Jan.	1881 .25
138	Standard, G. S.	Cal..	10 000,000	100,000	100	25,000	Oct.	1884 .25	4,425,000	May	1884 .25
139	Stormont, S.	Utah	500,000	500,000	1	*			155,000	Nov.	1881 .05
140	St. Joseph, L.	Mo..	1,500,000	150,000	10	*			754,000	Mar.	1887 .20
141	Syndicate, G.	Cal..	10,000,000	100,000	100	38,729	July	1882 .15	48,308	Sept	1885 .10
142	Tip Top, S.	Ariz.	10,000,000	100,000	100	250,000	Sept	1883 .25	100,000	Nov.	1881 .20
143	Tombstone, G. S. L.	Ariz	12,500,000	500,000	25	*			1,250,000	Apl	1882 .10
144	True Fissure, G. S. L.	Utah	1,500,000	150,000	10	*			75,000	Jun.	1883 .15
145	United Verde, C.	Ariz.	3,000,000	300,000	10	*			97,500	Feb.	1884 .20
146	Valencia, M.	N. H.	150,000	1,500	100	*			37,500	Apl	1886 2.50
147	Viola Lt., S. L.	Idah.	750,000	150,000	5	*			74,500	May	1887 .12½
148	Vizina, S.	Ariz.	5,000,000	200,000	25	*			140,000	Apl.	1882 .10
149	Yankee Girl	Colo.	2,500,000	250,000	10				1,075,000	Jan	1887 .05
150	Yellow Jacket, G. S.	Nev..	12,000,000	120,000	100	5,448,000	Dec.	1885 .75	2,184,000	Aug.	1871 1.50

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par Value	Assessments. Total levied.	Assessments. Date & am'un of last.	
1	Agassiz Cons., S. L.	Colo.	$2,500,000	50,000	$50	*		
2	Albion, S. L.	Nev..	15,000,000	150,000	100	$577,000	July	1882 .50
3	Alloucz, C.	Mich	2,000,000	80,000	25	240,000	Feb.	1884 .50
4	Alpha Con., G. S.	Nev..	3,000,000	30,000	100	445,000	Jan.	1887 .50
5	Alta, S.	Nev..	10,080,000	100,800	100	2,027,000	Feb.	1887 .50
6	Amador, G.	Cal..	400,000	200,000	2	*		
7	American Flag, S.	Colo.	1,250,000	125,000	10	300,000	Jun.	1877 .25
8	Anglo-Montana, Lt.	Mon.	600,000	120,000	5			
9	Appalachian, Lt., G.	N. C.	1,500,000	300,000	5			
10	Aspen Mg. & S., S. L	Colo.	2,000,000	200,000	10	*		
11	Barcelona, G.	Nev..	5,000,000	200,000	25	*		
12	Bechtel Con., G.	Cal..	10,000,000	100,000	100	173,500	Jan.	1888 .10
13	Belmont, S.	Nev..	5,000,000	50,000	100	735,000	Apl.	1886 .10
14	Best & Belcher, G. S	Nev.	10,080,000	100,800	100	1,798,990	Mar.	1887 .50
15	Big Pittsburg, S. L.	Colo.	20,000,000	200,000	100	*		
16	Bi-Metallic, S.	Mon.	5,000,000	200,000	25	*		
17	Black Jack, G.	Cal..	250.000	100,000	2½			
18	Bondholder	Colo.	500,000	200,000	2½			
19	Boston Con., G.	Cal..	13,000,000	100,000	100	170,000	Nov	1883 .25
20	Bradshaw, S.	Ariz.	2,250,000	225,000	10			
21	Brunswick, G.	Cal..	2,000 000	400,000	5	*		
22	Bullion, G. S.	Nev..	10,000,000	100,000	100	5,000,000	Jan.	1887 .40
23	Bye and Bye	Ariz.	1,000,000	100,000	10	*		
24	Calaveras, G.	Cal..	500,000	500,000	1	*		
25	Carisa, G.	Wy	500,000	100,000	5	*		
26	Con Contin'l, G. S. L.	C. & A	2,000,000	200,000	10	*		
27	Charles Dickens, G. S.	Idah.	1,250,000	250,000	5	*		
28	Cherokee, G.	Cal..	1,500,000	150,000	10			
29	Chollar, S.	Nev..	11,200,000	112,000	100	1,096,000	Nov	1886 .50
30	Cinnamon Mt., G. S	Colo	750,000	150,000	5			
31	Climax, S. L.	Colo.	2,000,000	200,000	10	*		
32	Colorado No. 2, S. L	Colo.	100,000	10,000	10			
33	Comstock, G. S.	Nev..	10,000,000	100,000	100	30,000	Mar.	1887 .15
34	Con. Imperial, G. S.	Nev..	50,000,000	500,000	100	1,100,000	Aug	1886 10
35	Con. Pacific, G.	Cal..	6,000 000	60,000	100	174,000	Feb.	1886 .15
36	Cons Silver, S.	Mo..	2,500,000	250,000	10			
37	Cop. Queen Cons, C.	Ariz	1,400 00	140,000	10			
38	Courtlandt	Colo	500,000	50,000	10			
39	Crescent, S. L.	Colo.	3,000,000	300,000	10	*		
40	Crocker, S.	Ariz.	10,000.000	100,000	100	75,000	May	1887 .10
41	Crowell, G.	N. C	500,000	5,000	1			
42	Dahlonega, G.	Ga...	250,000	250,000	1	*		
43	Dandy, S.	Colo.	5,000,000	500,000	10			
44	Daranaelles, G.	Cal..	1,000,000	100,000	10	*		
45	Decatur, S.	Colo.	1,500,000	300,000	5	*		
46	Denver City, S. L.	Colo.	5,000,000	500,000	10	*		
47	Denver Gold	Colo.	300,000	60,000	5			
48	Deseret, G. S.	Utah	500,000	50,000	10	*		
49	Dunderberg, S.	Colo.	1,500,000	150,000	10	*		
50	Durango, G.	Colo.	500,000	500,000	1	*		
51	Eastern Dev. Co., Lt.	N. S.	1,500,000	150 000	10	990.000	Mar.	1886 1.00
52	El Cristo, G. S.	U.S.C	1,000,000	500,000	2			
53	Empire Lt., G.	Mon.	5,000,000	150,000	5			
54	Empire, S.	Utah	10,000,000	100,000	100	*		
55	Enterprise, S. L.	Colo.	800,000	80,000	10	*		
56	Eureka Tunnel, S. L	Nev..	10,000,000	100,000	100	*		
57	Exchequer	Nev.	10,000,00	100,000	100	860,000	Oct.	1886 .20
58	Gold Cup, S.	Colo.	500,000	500,000	1	*		
59	Gold Placer, G.	Colo.	5,000,000	200,000	2 5	229,314	Dec.	1885 .25
60	Goodshaw, G.	Cal..	10,000,000	100,000	100	*		
61	Grand Belt, C.	Tex.	12,000,000	120,000	100			
62	Grand Duke	C. lo.	800,000	80,000	10			
63	Gregory-Bobtail, G.	Colo.	550,000	550,000	1	*		
64	Gregory Con., G.	Mon.	3,000,000	300,000	10			
65	Harlem M. & M. Co., G.	Cal..	1,000,00	200,000	5			
66	Head Cent. & Tr. & G	Ariz.	10,000,00	100,000	100			
67	Hector, G.	Cal..	1,500,000	300,000	5			
68	Highland, C.	Mich	500,000	25,000	25			
69	Hortense, S.	Colo.	2,000,00	200,000	10			
70	Huron, C	Mich	1,000,000	40,000	25	280,000	May	1887
71	Iron Gold & Silver, S	N. M	2,000,000	200,000	10			
72	Iroquois, C	Mich	1,250,000	50,000	25	*		
73	J. D. Reymert	Ariz	10,000,000	100,000	100	*		
74	Julia Cons., G. S.	Nev..	11,000,00	110,000	100	1,454,500	Apl.	1887 .15
75	Kearsarge, C.	Mich	1 250,000	50,000	25	100,000	Apl.	1886 5.00
76	Ladede	N. M	2,000,000	200,000	10			
77	Lacrosse, G.	Colo.	1 000,000	100,00	10	*		
78	Lee Basin, S. L.	Colo.	5,000,000	500,000	10	*		
79	Lucerne, S.	Colo.	5,000,000	500,000	10	*	Jan.	1885 .10
80	Mammoth Bar, G.	Cal..	10,000,000	100,000	100	50,000	Dec.	1881
81	Mariposa pref., G.	Cal	5,000,000	50,000	100	1,687,500	Feb.	1883 .25
82	" common, G.	Cal	10,000,000	100,000	100	1,975,000	Dec.	1881 .20
83	May Belle, G.	Cal..	10,000,000	100,000	100	84,000	Mar.	1884 .15
84	Mayflower Gravel.	Cal..	1,000,000	100,000	10	160,000	Mar.	1887 .25
85	Medora, G.	Dak.	25,000	250,000	1			
86	Mexican, S. S	Nev..	10,000,000	100,000	100	2,590,000	Jan.	1887 .25
87	Middle Bar G.	Cal.	400,000	200,000	2	*		
88	Mine & Starr, S. L.	Colo.	1,000,000	200,000	5	*		
89	Moose Silver, S.	Colo.	3,000,00	300,00	10	*		
90	Nachoochee, Lt., G.	Ga..	1,000,000	200,000	5			
91	Neath, G.	Colo	1,000,000	100,000	10			
92	Nevada Queen, S.	Nev.	10,000,000	100,000	100	80,000	Mar	1887 .50
93	New Germany, G.	N. S.	100,000	100,000	1			
94	New Pittsburg, S. L	Colo.	2,000,000	200,000	10			
95	North Standard, G.	Cal..	10,000,000	100,000	100	20,000	Nov	
96	Noonday	Cal..	600,000	60,000	10	205,000	Dec.	1881 .10
97	Oneida Chief, G.	Cal	500,000	125,000	4			
98	Oriental		2,000,00	200,000	10			
99	Oriental & Miller, S.	Nev..	10,000,000	400,000	25			
100	Overman, G. S.	Nev.	11,520,000	115,200	100	3,736,880	Jan.	1887 .30
101	Park, S.	Utah	2,000,000	200,000	10			
102	Peer, S.	Ariz.	10,000,000	100,000	100	135,000	Nov.	1886 .10
103	Peerless, S.	Ariz.	10,000,000	100,000	100	295.000	Nov.	1886 .20
104	Phœnix	Ariz.	500,000	500,000	1			
105	Phœnix, G. S.	Ariz.	5,000,000	200,000	25	*		
106	Phœnix Lead.	Colo.	100,000	100,000	1	*		
107	Potosi	Nev..	11,200,000	112,000	100	1,145,600	Mar.	1887 .30
108	Princeton	Colo.	100,00	100,000	1			
109	Puritan, S. G.	Colo.	1,500,000	150,000	10	*		
110	Quin y	Colo.	3,000,000	300,000	10	*		
111	Rappahannock, G. S.	Va..	250,000	250,000	1	*		
112	Red Elephant, S.	Colo	500,000	500,000	1	*		
113	Robins, G. S.	Colo.	5,000,000	200,000	25			
114	Ropes, G. S.	Mich	2,000,000	80,000	25	63,200	Mar	1886 .10
115	Rus-ell, G.	N. C.	1,500,000	300,000	5			
116	Sampson, G. S. L.	Utah	10,000,000	100,000	100	230,000	Mar	1887 .25
117	Santiago, G.	U S C	40 000	200,000	2	*		
118	Security, S.	Colo.	10,000,00	1,000,00	10			
119	Sheridan,	N. M.	2,000,000	200,000	10			
120	Silver Queen, C.	Ariz.	5,000,000	200,000	25	*		
121	Sonora Con.	Mex	5,000,000	200,000	25	*		
122	South Bulwer, G	Cal..	10,000,000	100,000	100	100,000	May	1881 .25
123	South Hite	C

NEW YORK MINING STOCK QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	May 28.		May 30.		May 31.		June 1.		June 2.		June 3.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alice, Mon	1.35	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Argenta, Nev	.50	.....	.....	.....	.52	.51	.52	.50	.51	.....	.51	.....	2,400
Bassick, Colo	.....	.....	.....	.....	.....	.....	.16	.....	.....	.....	.....	.....	100
Belcher, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belle Isle, Nev	.86	.....	.....	.....	.95	.87	1.10	1.00	1.20	1.15	1.30	1.25	4,000
Bodie Cons., Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Breece, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bulwer, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Caledonia, Dak	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.25	1.15	200
Castle Creek, Id	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chollar, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chrysolite, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Colorado Cent'l, Colo	.....	.....	.....	.....	.....	.....	.....	.....	2.70	2.55	.....	.....	600
Cons. Cal. & Va., Nev	19.75	.....	.....	.....	22.50	.....	22.50	.....	24.38	23 00	.....	.....	700
Crown Point, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Deadwood, Dak	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dunkin, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Eureka Cons., Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6. 0	.....	200
Father de Smet, Dak	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Freeland, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gold Stripe, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gould & Curry, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Green Mountain, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.38	.....	100
Hale & Norcross, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Helena, Mont	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Holyoke, Idaho	.15	.....	.....	.....	.....	.....	.15	.14	.....	.....	15	.13	3,800
Homestake, Dak	.....	.....	.....	.....	16.00	.....	.....	.....	15.50	15 25	15.50	15.25	890
Horn-Silver, Ut	..	..	.....	.....	.....	.....	.....	.....	.....	.....	1.10	1.05	1,000
Independence, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iron Hill, Dak	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iron Silver, Colo	.....	.....	.....	.....	3.00	.....	3.10	3.05	.....	.....	.....	.....	700
Leadville C., Colo	.....	.....	.....	.....	.64	.....	.....	.....	.....	.....	.....	.....	100
Little Chief, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.38	.....	500
Little Pittsburg, Colo	.....	.....	.....	.....	.44	.....	.....	.....	.....	.....	.....	.....	200
Martin White, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mono, Cal	.....	.....	.....	.....	.....	.....	2 75	.....	.....	.....	.....	.....	100
Moulton, Mont	.....	.....	.....	.....	.....	.....	.....	.....	1.50	.....	.....	.....	100
Navajo, Nev	.....	.....	.....	.....	.....	.....	1.50	1.40	1.45	.....	.....	.....	900
North Belle Isle, Nev	.....	.....	.....	.....	.....	.....	9.50	.....	.....	.....	9.38	.....	200
Ontario, Ut	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ophir, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Plymouth, Cal	.....	.....	.....	.....	.....	.....	20 00	.....	20.13	.....	.....	.....	200
Quicksilver Pref., Cal	34.50	34.25	.....	.....	33.25	33.00	33.75	33 50	33.75	.....	.....	.....	800
" Com., Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Robinson Cons., Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Savage, Nev	.....	.....	.....	.....	.....	.....	5.85	.....	.....	.....	.....	.....	100
Sierra Nevada, Nev	.....	.....	.....	.....	.....	.....	5.50	.....	.....	.....	.....	.....	200
Silver King, Ariz	.....	.....	.....	.....	9.50	.....	.....	.....	.....	.....	.....	.....	20
Standard, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.05	.....	200
Stormont, Ut	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yellow Jacket, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	May 28.		May 30.		May 31.		June 1.		June 2.		June 3.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alta, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Amador, Cal	2.10	.....	.....	.....	2.10	.....	2.10	.....	2.10	.....	2.10	2.00	5,800
Am. Flag, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Barcelona, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bechtel Con., Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Best & B'lcher, Nev	8.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	200
Big Pittsb'g, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brunswick	1.45	1.40	.....	.....	1.45	1.40	1.50	1.45	1.45	1.40	1.50	1.45	41,000
Bullion, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Central Ariz., Ariz	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.12	.11	800
Columbia & Beaver	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cons. Imperial, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Con. Pacific, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Decatur, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Durango, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Eastern Oregon	.04	.03	.....	.....	.04	.....	.....	.....	.04	.....	.....	.....	2,500
El Cristo, U. S. Col	6.50	6.38	.....	.....	6.25	.....	6.00	.....	6.00	.....	6.37	6.00	2,950
Gold Placer, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hortense	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Julia, Nev	.85	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.06	.....	300
Justice, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kossuth, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lacrosse, Colo	.....	.....	.....	.....	.....	.....	.13	.....	.....	.....	.....	.....	800
Mexican, Nev	.....	.....	.....	.....	6.00	.....	.....	.....	.....	.....	.....	.....	50
Middle Bar, Cal	.97	.....	.....	.....	.99	.96	1.00	.99	.99	.98	.99	.98	22,700
New Germany, N.S.	.43	.42	.....	.....	.....	.....	.42	.....	.....	.....	.....	.....	900
New Pittsb'g, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Stand'd, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Horn-Silv'r, Ut	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oneida Chief	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.00	.....	400
Ori'nt'l & Mil'r, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
*Phœnix, Ariz	1.88	.....	.....	.....	1.88	.....	1.88	1.50	1.63	1.50	1.63	1.00	17,150
Potosi, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rappahannn'k, Va	.....	.....	.....	.....	.21	.....	.21	.20	.21	.....	.20	.....	2,500
Red Elephant, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.03	.....	.....	.....	500
Renfrew, N. S	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.65	.....	100
Saint Kevin, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Sebastian	.....	.....	.....	.....	4.00	.....	.....	.....	.....	.....	2.75	.....	200
Santiago, U. S. Col	4.25	4.00	.....	.....	4.20	.....	3.85	3.00	3.00	.....	2.90	2.85	4,525
Security, Colo	7.25	7.00	.....	.....	7.38	7.00	7.38	7.00	7.50	6.75	7.50	7.00	35,460
Silver Cliff, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.13	.....	100
Silver Leaf	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.80	.....	100
Silver Queen, Ariz	.....	.....	.....	.....	.....	.....	.....	.....	.09	.....	.08	.....	800
Stanislaus, Cal	2.15	2.05	.....	.....	2.15	2.00	2.15	2.05	2.15	2.00	2.10	2.05	3,300
State L'e, 1&2, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" Nos. 2 & 3, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sutro Tunnel, Nev	.38	.36	.....	.....	.36	.....	.38	.36	.37	.35	.36	.35	14,300
Taylor Plumas, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unadilla, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Union Cons., Nev	.....	.....	.....	.....	.....	.....	.....	.....	4.75	4.50	.....	.....	200

* Dealt in at the New York Stock Exchange Unlisted Securities.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	May 27.		May 28.		May 30.		May 31.		June 1.		June 2.		SALES.
Atlantic, Mich	.....	.....	.....	.....	.....	.....	9.00	.....	.....	.....	.....	.....	175
Bodie, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bonanza D	1.75	1.63	1.75	.....	.....	.....	1.75	.....	1.75	.....	1 63	1.60	1,500
Boston & Mont., Mont	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Breece, Colo	.....	.....	.50	.30	.....	.....	.....	.....	.....	.....	.55	.....	500
Calumet & Hecla, Mich	211	.....	.....	.....	.....	.....	210	.....	211	.....	.....	.....	36
Catalpa, Colo	.32	.....	.32	.....	.....	.....	.....	.....	.31	.....	.....	.....	600
Central, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chrysolite, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Con. Virginia, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dunkin, Colo	.44	.....	.....	.....	.....	.....	.42¼	.....	.....	.....	.....	.....	500
Eureka, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Franklin, Mich	.....	.....	11.50	.....	.....	.....	11.75	.....	11.75	.....	11.75	11.13	410
Freeland, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Helena, Mont	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Honorine, Utah	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ironton Iron Co., Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Napa, Cal	.....	.....	1.13	.....	.....	.....	.....	.....	.....	.....	1.13	.....	300
Osceola, Mich	26.50	26.00	26.50	.....	.....	.....	27.00	26 87	27.50	27.00	29.87	29 00	1,596
Pewabic, Mich	2.06	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.25	.....	78
Quincy, Mich	49.50	49.00	50.00	49 50	.....	.....	50.00	49.87	.....	.....	50.00	.....	159
Ridge, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Robinson, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silver King, Ariz	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Standard, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Stormont, Utah	.10	.....	.....	.....	.....	.....	.....	.....	.10	.....	.....	.....	500

NAME OF COMPANY.	May 27.		May 28.		May 30.		May 31.		June 1.		June 2.		SALES.
Allouez, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.13	.....	200
Arnold, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Aztec	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Blue Ridge, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bowman Silv'r, Nev	.....	.....	.....	.....	.04	.....	.....	.....	.....	.....	.....	.....	700
Brunswi'k	1.40	.....	1.40	.....	.....	.....	1.45	1 40	1 47	1.42	1.45	.....	4,400
Contentment	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
C. n. Pacific, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crescent, Colo	.....	.....	.....	.....	.....	.....	.10	.....	.....	.....	.10	.....	100
Cusi, N. Mex	.....	.....	.....	.....	.....	.....	.14	.....	.15	.13	.....	.....	700
Decatur, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Empire, Utah	.....	.....	.....	.....	.....	.....	.07	.....	.....	.....	.....	.....	200
Fern	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Huron, Mich	.....	.....	.08	.....	.....	.....	.....	.....	.....	.....	.08	.....	200
Kearsarge, Mich	.....	.....	.....	.....	.....	.....	6 50	.....	.....	.....	.....	.....	100
Menard, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mono, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
National, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Native, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oriental & M., Nev	.21	.....	.21	.....	.....	.....	.20	.....	.21	.....	.....	.....	1,300
Phœnix, Ariz	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rappahannock, Va	.23	.22	.23	.22	.....	.....	.23	.22	.22	.....	.22	.....	3,000
Security, Colo	.....	.....	.....	.....	.....	.....	7.13	.....	.....	.....	.....	.....	100
South Side	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sutro Tunnel, Nev	.37	.....	.....	.....	.....	.....	.37	.....	.37	.....	.36	.....	1,000
Tamarack, Mich	.....	.....	.....	.....	.....	.....	.88	.....	.90	.....	.88	.....	100
Taylor Plumas, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

New York: Dividend shares sold, 18,410. Non-dividend shares sold, 157,655 Total New York, 176,065.
Boston: Dividend shares sold, 6,354. Non-dividend shares sold, 12,159. Total Boston, 18,513.

COAL STOCKS.

NAME OF COMPANY.	Par value of shares.	May 28.		May 30.		May 31.		June 1.		June 2.		June 3.		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Barclay Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cameron Coal	100	.....	.....	.....	.....	41	.....	.....	.....	.....	.....	.....	.....	200
Col., C. & I	100	50¼	49¾	.....	.....	51¼	50	51⅝	50¼	51¾	50	50¾	50¼	4,735
Ches. & O. RR	100	.....	.....	.....	.....	.....	.....	.....	.....	71⅞	.....	.....	.....	50
*Chic. & Ind. Coal RR	.....	.....	.....	.....	.....	62	.....	60	59	.....	.....	60	.....	270
Do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	99	.....	50
Col. & Hocking Coal	.....	46¼	.....	.....	.....	46¼	45⅞	45⅞	45⅝	45¾	45¼	44⅞	42½	6,213
Consol. Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cumb. C. & I	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Del. & H. C	100	103¼	102⅞	.....	.....	104⅝	103⅛	104⅝	104⅛	103⅞	103¼	104¼	103⅜	6,682
D., L. & W. RR	50	137½	137⅜	.....	.....	139¼	137⅝	139½	139	139	138	139	138	54 552
Elk Lick Coal Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hocking Valley	100	38⅛	.....	.....	.....	33⅛	.....	33⅛	.....	33	32	33⅛	32⅛	3,015
Lehigh C. & N.†	50	50¾	.....	.....	.....	50¾	.....	.....	.....	.....	.....	.....	.....	405
Lehigh Valley RR.†	50	56	.....	.....	.....	56	55⅞	56	.....	56	55⅞	.....	.....	300
L. & W. C. & I. Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maryland Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Marshall Con. Coal	.....	20	27⅝	.....	.....	29	27½	28⅛	27⅞	27½	25⅛	26⅞	26¼	3,400
Montauk Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morris & Essex	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	140	.....	80
New Central Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	.....	100
N. J. C. RR	100	80¾	80⅝	.....	.....	82¼	81	83⅛	82⅛	83	81⅞	84⅝	82⅛	36,262
N. Y. & S. Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Y., Susq. & Western	100	.....	.....	.....	.....	12⅛	12⅛	12⅞	.....	12⅝	12	12⅛	12	1,353
Do. pref	100	36⅛	.....	.....	.....	36⅜	36¼	36⅝	36⅛	36⅝	35⅛	35½	35⅛	2,055
N. Y. & Perry C. & I	100	.....	.....	.....	.....	70⅛	70	70⅝	70⅛	.....	.....	70⅝	70⅛	600
Norfolk & Western R R	100	21	.....	.....	.....	21¾	21	21	20½	20¼	.....	20¾	20¼	1,770
Do. pref	100	54	53¾	.....	.....	53½	52¾	53	52⅝	53¼	51⅛	52½	51	17,796
Penn. Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Penn. RR.†	50	56	55¾	.....	.....	56⅛	55⅞	56⅜	56⅛	56	56⅜	.....	.....	6,457
Ph. & R. RR.**	50	46¼	45¾	.....	.....	47⅛	46½	53‡	52¼	52½	51¼	52⅝	51⅞	318,302
Spring Mountain	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee C. & I. Co	100	.....	.....	.....	.....	39¾	39	39¾	39¼	39	38⅝	38⅛	38	3,440
Westmoreland Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

** Of the sales of this stock, 48,472 were in Philadelphia, and 269,830 in New York.
† The quotations for these stocks are not percentage, but actual price. Total sales, 468,087.
* Dealt in at the New York Stock Exchange, Unlisted Securities. ‡ Assessment paid.

San Francisco Mining Stock Quotations.

COMPANY.	Closing Quotations. May 27.	May 28.	May 30.	May 31.	June 1.	June 2.
Albion	.. ..	..	.....	.....	.....	.....
Alpha	.....	.....	.....	.....	.....	.....
Alta	3	2¾	.....	3	3⅛	3⅛
Argenta	.....	.....	.....	.....	.....	.....
Bechtel	..	..	.....	.....	.....	.....
Belcher	.....	.....	.....	.....	.....	.....
Belle Isle	.....	.....	.....	.....	.....	.....
Best & Belcher	8⅛	7⅛	.....	9	8⅝	9¼
Bodie	2⅛	2⅛	.. ..	2⅝	2⅛	2⅛
Bulwer	1¼	1¼	.....	1¼	1¼	.....
Chollar	7⅛	7¼	.....	7⅛	.....	7⅛
Con. Cal. & Va.	19⅛	18¼	.....	21⅛	21¼	22⅛
Con. Pacific	.....	30	.....	.....	25	.....
Crown Point	7¾	5⅛	.....	7⅛	7⅛	7⅛
Eureka Cons	6¼	6¼	.....	6⅝	6¼	6¼
Gould & Curry	5⅛	4¾	.....	5¼	5¼	5¼
Grand Prize	.....	.....	.....	140	13	100
Hale & Norcross	5½	5⅛	.....	5¾	5¾	5⅝
Martin White	.....	.....	.....	.....	.....	.....
Mexican	5⅝	5⅞	.....	5⅝	5⅝	5⅝
Mono	2⅛	2⅛	.....	2¼	2⅛	2⅛
Mount Diablo	3¾	.....	.....	.....	3⅛	.....
Navajo	1⅜	1¼	.. ..	1¼	1⅜	1¼
Ophir	19⅛	.....	.....	10¾	10⅝	11⅜
Potosi	8⅝	8⅝	.....	8½	8¼	8⅝
Savage	5⅞	6¼	.....	6¼	6⅛	6¼
Scorpion	.....	.....	.....	.....	.....	.....
Sierra Nevada	5¼	5⅝	.....	5¼	5⅜	5⅝
Sutro Tunnel	.....	.....	.....	.....	.....	.....
Tip Top	.....	.....	.....	.....	.....	.....
Union Cons	4¼	4¼	.....	4¼	4¼	4⅛
Utah	2¼	2⅜	.....	3⅜	3¼	2⅜
Yellow Jacket	6⅛	6¼	.....	6½	6	5⅝

Birmingham, Ala., Stock Quotations.

Company.	Bid.	Asked.
Alabama Connellsville C. & C.	75	100
Birmingham Min. & Mfg. Co.	200	253@300
* Coalburg Coal & Coke Co.	...	....
Debardieben C. & I. Co	....	100@102½
Decatur Land & Imp. Co.	17½@19	20
Decatur Mineral Land Co	25	....
Enterprise Mfg. Co.	90	100
Sloss Iron & Steel Co	....	50
* Sloss Iron & Steel Co	....	....
Sheffield Coal & Iron Co.	....	145@147½
Selma Land & Imp. Co	....	....
Tuscaloosa C. & I. Co., paid.	50	96½@97½
† Tuscaloosa C. & I. Co.	20	27½@31
Woodstock Steel & Iron Co.	....	....

* Bonds. † Thirty per cent paid.

Highest and lowest prices bid and asked during the week ended May 31st.

Deadwood-Dakota Mining Stocks.

Company:	H.	L.	Company:	H.	L.
Bullion	.07	.05	Mutual	.04	.04
Centre Shot	.02¾	.01½	Pocahontas	.02½	.01
Cora	.10½	.10	Rattler	.30	.23
Eureka	.09	.07	Ruby Bell	...	...
Enterprise	.02½	.01	Seabury Calkins	.20	.13
Hester A	.12½	.09	Seg. Iron Hill	.10	.05¼
Iron Hill	2.00	1.72½	Silver Ridge	.02	.01¾
Jefferson	.15	.12	Spanish R	.08	.08
Liberty	.02½	.01¼	Uncle Sam	.40	.40
Minna	.02	.01¼	U. S. Grant	.05	.02¼
Mugwump	...	...	West Virginia	.10	.09

Highest and lowest prices bid and asked during the week ended May 28th.

Gogebic Iron Stocks.

The market is firm, with indications of higher prices in the near future. All the developed properties continue to improve as depth is gained, and the general outlook is most encouraging.

For the purpose of giving those who desire to visit the Gogebic Range an opportunity to do so, it has been arranged with the Milwaukee, Lake Shore & Western Railway to run an excursion from Chicago and Milwaukee to the range and Ashland on Monday, June 13. Fare for the round trip from Chicago will be $10, and from Milwaukee $8, tickets good for ten days, and can be used to return on any regular train.

Name.	No. of shares.	Pres't value.	Name.	No. of shares.	Pres't value.
Agogebic	40,000	$2.00	Iron Chief	40,000	$5.00
Akron	40,000	2.50	Kakagon	40,000	12.50
Aurora	100,000	20.00	Laura	40,000	2.50
Anvil	40,000	12.00	Montreal	20,000	32.00
Amazon	40,000	4.25	Moore	40,000	3.50
Ashland	40,000	50.00	Mikado	40,000	3.00
Atlantic	40,000	5.00	Minnewawa	40,000	4.50
Atlas	40,000	3.00	Nimikon	40,000	8.00
Berringer	100,000	2.50	Nort'rn Chief	30,000	125.00
Bonnie	40,000	7.75	Norway	20,000	3.00
Blue Jacket	40,000	5.50	Norrie	30,000	35.00
Black River	20,000	20.00	Odanah	20,000	10.50
Bessemer	20,000	9.00	Old Nokomis	40,000	1.75
Brotherton	80,000	5.25	Pabst	250	2.000
Bourne	40,000	5.00	Puritan	40,000	25.00
Crown Point	100,000	2.00	Pence & Snyder I. D. Co.	100,000	5.00
Caledonia	40,000	2.50	Pence	40,000	5.00
Colby	*	*	Penokee & G. D. Co	5,000	650.00
Emma	40,000	2.50	Palms	40,000	7.00
Empire	40,000	2.75	Prospect Hill	40,000	3.00
Father Hennepin	40,000	4.00	Ryan	40,000	6.00
First Nation'l	80,000	4.00	Superior	100,000	3.25
Flor'ce May	40,000	2.75	Section 33 Co	20,000	10.00
Germania	40,000	13.00	Sunday Lake	40,000	8.00
Gogebic I. Sy	200,000	3.75	Snider	40,000	5.00
Gogebic R. & I. Co. (fee)	40,000	5.00	Trimble	40,000	7.00
Gogebic	40,000	2.00	Tontine	40,000	3.50
Iron Belt	200,000	3.25	Union	40,000	2.50
Iron King	40,000	18.00	United I. & L. Syndicate	200,000	.30
Ironton	40,000	10.00	*W L. & Min'l	90,000	1.25
Iron Prince	40,000	3.00	Valley	120,000	3.00
Ironsides	40,000	3.00			

* See Penokee & Gogebic Development Company. † Includes fee.

The shares of the above companies all have a par value of $25, excepting the Pabst, the Penokee & Gogebec Development Company, and the Northern Chief, which are $100 par, and the Superior and Wisconsin Land and Mineral Company, $10 par.

Pittsburg Stock Quotations.

Company.	H.	L.	Closing.
Alleghany Gas Co.	$36.50	$35.50	$36 50
Bridgewater Gas	107.50	107.00	107.50
Chartiers Valley Gas Co.	87.00	85.00	86.00
Chartiers Block Coal Co.	40.00	40.00	40.00
Columbia Oil Co.	1.50	1.50	1.50
Consignee Mining Co.	1.00	1.00	1.00
Consolidated Gas Co.	45.00	45.00	45.00
Forest Oil Co	98.00	98.00	98.00
Hidalgo Mining Co	.25	.25	.25
La Noria Mining Co	5.25	4.87½	5.12½
Manufacturers Gas Co	95.00	95.00	95.00
Natural Gas Co. of West Va.	45.00	45.00	45.00
N. Y. & Cleve. Gas Coal Co.	44.50	44.00	44.00
Penn. Gas Co	.....	.....	.....
Philadelphia Co.	51.87½	51.25	51.37½
Pine Run	100.00	100 00	100.00
Silverton Mining Co.	1.75	1.75	1.75
South Side Gas Co.	27.50	27.50	27.50
Tuna Oil Co	66.50	66.50	66.50
W'tmorel'd & Cambria Gas.	50.00	47.50	50.00
Westinghouse Air-Brake Co.	116.00	114.00	116.00
Wheeling Natural Gas Co.	38.50	*37.00	38.00
Yankee Girl Mining Co.	9.25	9.00	9.25

Highest and lowest prices during the week ended June 1st.

* Ex-dividend.

London Stock Quotations of American Mines.

Company.	Highest.	Lowest.
Alturas Gold, Idaho	20s.	15s.
Arizona Copper, Ariz.	15s.	14s. 6d.
Birdseye Creek, Cal.	15s.	13s.
California Gold, Colo.	8s.	7s.
Carlisle, N. Mex	25s.	17s. 6d.
Charles Dickens, Idaho	20s.	15s.
Colorado United, Colo.	£1¼	£1
Denver Gold, Colo.	3s. 6d.	2s.
Eberhardt, Nev	12s.	9s. 6d.
Empire, Mont.	£3¼	£3
Flagstaff, Utah	9s.	5s.
Garfield, Nev.	30s.	27s. 6d.
Gold Hill, N. C.	3s. 3d.	2s.
Kohinoor, Colo.	3s.	2s.
La Plata, Colo.	5s.	4s.
Montana Lt., Mont	£8⅛	£8⅛
New California, Cal	8s.	7s.
New Emma Silver, Utah	8s.	6s. 6d.
New Hoover Hill, N. C.	3s. 6d.	2s. 6d.
New La Plata, Colo.	5s.	4s. 6d.
Plumas Eureka, Cal.	£¾	£⅛
Richmond Con., Nev.	£4¾	£4⅛
Ruby & Dunderberg, Nev	7s. 6d.	6s. 6d.
Russell Gold, N. C.	11s.	10s.
Sierra Buttes, Cal	£1⅝	£1
Union Gold	20s.	15s.
U. S. Gold Placer, Colo.	£1	£¾
Viola Lt., Idaho	£2⅜	£2
Quoted in Paris.		
Lexington, Mont.	†40.00	†40 00
" (organizers' shares)	†2.00	†2.00

† Francs.

Highest and lowest prices during week ended May 21st.

St. Paul, Minn., Stock Exchange.

The St. Paul Stock Exchange has opened for business, with a membership of eighty-five, and it is stated that since, there have been numerous applications for seats. The institution promises to be a flourishing one. Several mining companies have been listed. Business is also done in local and railroad stocks.

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